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The Art of Grafting

by W. H. Alderman

University of Minnesota

THE INTEREST of horticulturists in the subject of grafting is perennial. The art of grafting, however, is not new. On the contrary, it is one of the oldest of the recorded practices of the plant grower. The dawn of the Christian era found this practice well established with writers of that time describing forms and methods of grafting very similar, if not identical, to the forms used today. Pliny, writing before the birth of Christ, discussed the history of grafting, indicating that it was an old practice at that time. In those early days it was probably regarded as a rather mysterious art and was practiced only by expert craftsmen who guarded their secret jealously. Even today to the uninitiated it seems a strange and rather mysterious practice.

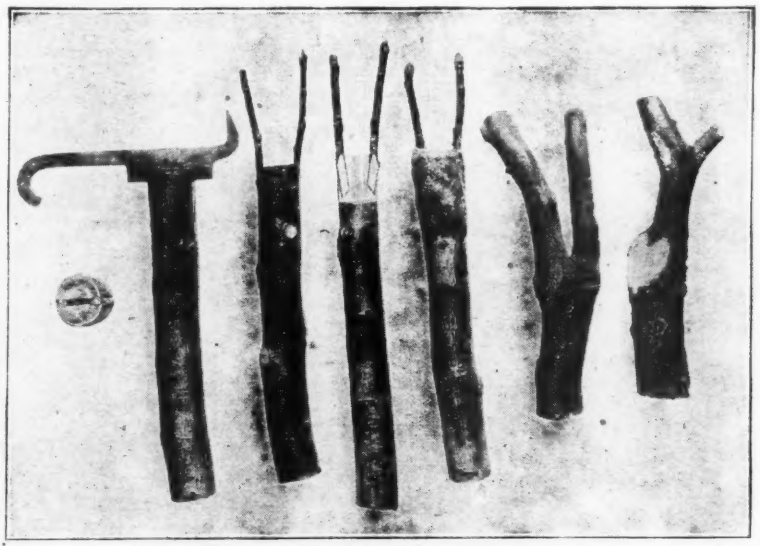
Grafting is used for three general purposes, but these are fundamental and of vital importance to horticulture as an industry. It is used, first, to propagate varieties of nursery trees and plants which do not come true from seed; second, to topwork trees of worthless varieties to change them to more valuable kinds or for the novelty of growing several varieties or kinds of fruit on a single plant; and third, to repair damage to trees injured by disease or girdled by rodents.

The principle involved in all grafting, whether it be of woody or herbaceous plants, is to bring the growing or living part of the stock and scion in close connection. The living part of all plants and trees which have a true bark is found in the inner bark, or that portion of the plant between the bark and the wood. This is called the cambium layer from which all growth takes place. Consequently it is necessary to have the cambium of both stock and scion come into actual contact in one or more places. It is also necessary to cover this union with grafting wax or similar material to exclude air, for otherwise this living tissue would quickly dry out and die before a union could be effected.

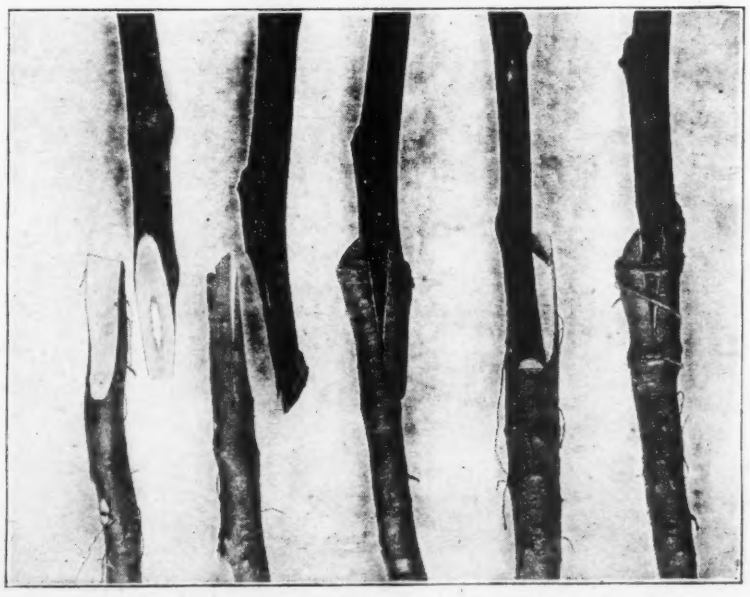
The ancients assumed that any kind of a plant could be grafted on any other kind of a plant. Virgil speaks of grafting the grape on the elm and the apple on the plane tree. It is now well understood that there are practical limits beyond which we cannot expect to go in grafting. Trees and plants of a similar nature only can be put together and usually the greatest success is attained only when different varieties of the same kinds of fruit are used. It is quite possible, however, to unite the apple with the pear, the plum with the peach, the pear with the quince, and so on, but it is for all practical purposes impossible to graft a stone fruit on to a fruit like the apple. Many curious unions can be made, however, and the amateur may get a great deal of fun from trying as many interesting combinations as possible. The writer once heard of a paper birch being grafted on a white pine, but was never able to definitely verify the account.

Spring Is the Best Time to Do Grafting.

Grafting ordinarily is accomplished in the spring just as the buds are about to break. Success is more certain at this time than at any other, but experienced men sometimes successfully set grafts even after the trees have come into full leaf. One of the secrets of successful grafting, however, is to use scions which are absolutely dormant and to make the graft just before or at the time growth is started so that there will be little danger of the cut surface drying before it establishes a union.



Cleft Graft—All operations shown from splitting the stock to removing one of the growing scions after two years' growth.



Root Graft, illustrating several steps in making the whip graft.

The scions should be collected during the early part of the winter, before there is any chance of the wood suffering from winter injury. Good scion wood consists of the tip shoots which have grown the preceding summer, that is, one-year-old wood. These straight shoots have no side branches but are covered with strong, healthy buds. Ordinarily the stronger and larger these shoots, the better, up to a length of two feet, or even more. The scions should be tied in bundles, labelled with the name of the variety of fruit, and packed away in damp sand or, better yet, in old damp sawdust, and placed in a cool cellar. If such a storage place is not available, they may be buried in the soil on the north side of a building where they will freeze in and hold dormant until ready for use. When stored in a cellar, they should be examined occasionally and perhaps watered to prevent drying out. They should be kept damp but not wet.

Formula for Grafting Wax.

Grafting wax, or similar material, must be used to make the union airtight. An old and reliable formula for grafting wax is four parts of resin, two parts beeswax, and one part of tallow. These ingredients should be melted over a slow fire until no lumps of resin remain. It is then removed, cooled somewhat and poured into a tub of cold water. With hands well greased to prevent sticking, the wax may be worked and pulled like molasses candy until it assumes a smooth grain, when it may be rolled into balls of convenient size and put away for future use. The best method of applying is to melt the wax and put it on with a small brush. A good melting pot is on the market which consists of a small cup or basin inserted in the top of a kerosene burning lantern. An improvised affair may be used, however, by building a small fire in an old tin pail and suspending a small basin over the top. Within recent years ordinary paraffin has been used successfully in the place of grafting wax.

Methods of Grafting.

There are a score or more of specialized forms of grafting but only four methods will be described here. These are the common forms which may be used successfully under almost any conditions and with most materials.

Cleft Graft. The cleft graft is used in topworking large trees where limbs an inch or more in diameter are to be grafted. The limbs are cut off squarely with a saw at the point where they are to be grafted. This should be at a place where the bark is free from knots and imperfections. The end of the limb is then split and the two halves held apart with a wedge. A grafting chisel is not only a convenience but almost a necessity for this work if many grafts are to be made. The scions are then prepared by cutting the lower end in a wedge shape with one edge of the wedge slightly thinner than the other. It is desirable to make this wedge point just below a vigorous bud. The scion is then cut off so that about three or four buds remain, the cut on the upper end being made from one-eighth to one-fourth of an inch above the bud. Two of these scions are usually inserted in the cleft, the thin edge of the wedge being placed to the inside so that when the two halves of the limb are allowed to spring together, the scion will be held firmly in position with its inner bark pressed tightly against the inner bark of the

(*Continued on page* 16.)

Story of Dale Bessire, Hoosier Orchardist

by David I. Day

THE STORY of Dale Bessire and his Nashville Orchards is another romance of American business that is stranger than the average fiction. Dale Bessire was a city-bred man and a product, educationally speaking, of the University of Chicago. His wife was born and reared in Chicago. As a general proposition, if a city man makes a success of a rural enterprise, it will be found that his wife was a farm girl and furnished the farm sense, for, at least, a while until the masculine third of the household got its bearing. But in the Bessire home, country life was an unknown quantity to all concerned. To quote Mr. Bessire, "Of rural life or orcharding, we knew practically nothing and nothing practical."

Ill health proved, in the case of Indiana's most widely known fruit man, to be a blessing in disguise. After he left college, he entered the offices of his father and prospered until the doctor told him to make tracks toward the open country and outdoor life or the undertaker would give him a free ride to the cemetery. For weeks thereafter he read the "Farms for Sale" advertisements of the daily papers and the farm papers. At last he found one suited in price to his pocketbook and in description to his vaguely outlined desire. But it was located down in Brown county! The "Mountain County!" The backwoods of backwoods!

One must be a native of Indiana to know the peculiar odium attached in yester-years to residence down in the "hills o' Brown." But Bessire, after looking over the property, bought it—an old run-down place with an abandoned apple orchard of 1200 trees and an old log cabin to live in. For years the insects and worms had harvested the apple crop and sassafras and sage grass grew rampant over the wild hills. To this bleak prospect came 12 years ago, inexperienced and unhappy, sick and uncertain, the future apple king of Indiana. Now that success has smiled upon him richly, he admits that the first summer was so hard and discouraging that if it had not been for the encouragement of an optimistic wife, he should have given up in despair.

Makes a Success of Orcharding.

That long, hot first summer found Bessire trying to farm a little and doing his best to prune and spray and cultivate the old orchard according to the best advice of Purdue University. The natives winked at each other. The idea of trying to raise apples in that old orchard was amusing to them all. Even Bessire was a bit skeptical of results. But that fall the apples were there and they were not worm eaten nor full of insects! Five thousand bushels of these marketable

A straightaway view of the old orchard. Note distant skyline of hills.

apples were disposed of at the place, on the Indianapolis market straight and the next spring from cold storage and the average price was $2 a bushel. The old log cabin gave place to the beautiful bungalow, money was in the bank and joy was in the hearts of the young folks so far from the bright lights of the city they understood. "From that time on I had no other thought than to be an orchardist for good," said Mr. Bessire. "I forgot city life and the ambitious business plans I had nurtured from early youth and intensively and earnestly, I have given my best thought and energy to the business of fruit growing."

One of the most prolific apple trees in the orchard in full fruit.

Believes It Is Impossible to Overwork Cultivation.

Thousands of young apple trees have been set out since Bessire's success became an assured fact, but the old faithful 1200 trees are still going strong and are at least 21 years old. Constant, scientific care is the practice at the Nashville Orchards, as Bessire calls his place now. Cultivation, cultivation, cultivation is Bessire's battle cry. He says it is impossible to overwork cultivation.

The largest apple orchard in Indiana is now supplemented by an immense young peach orchard—an indication that Dale Bessire is out looking for new worlds to conquer. Brown county has developed with Bessire. It is not the "backwoods" any longer. A beautiful concrete boulevard has been built the length of this mountainous district and tourists by thousands invade the county, looking at the marvelous scenery. Poets of national reputation, landscape painters, novelists, historians and musicians have a colony of their own now down in Brown county. Dale Bessire, himself, is an artist of no mean ability.

From some of these artistic neighbors, Dale Bessire leases the fruit farms they have developed because he knows the marketing end well enough to make some money for all concerned. One of these neighbors is the noted biographer of James Whitcomb Riley, the lovable and scholarly Marcus Dickey. Another of his friends and neighbors is Thomas C. Steele, the greatest living landscape painter.

Suitable Methods Should Be Worked Out.

Orcharding in rough sections involves the working out of methods suited to the location. All the trees at the Nashville Orchards, for instance, are planted around the hill parallel with the contour of the ridges. In setting out new acreage, about four times as many trees as the permanent orchard will have are set out. This system allows the profit from the bearing of the young trees and permits final selection on the basis of performance alone. Fertilization is a constant practice. Bessire is constantly warning his visitors that all hill land is not orchard land. "It seems to be very common," he says, "for a man to begin planning on an orchard as soon as he inherits or buys some worn-out hill land. This is a fallacious idea and has cost Hoosiers a pile of money. The soil of the farm, the market and the cost of development should all be very carefully investigated before a man throws any good money away on an orcharding scheme."

Will Market Fruit at Home.

Bessire's next big achievement will be that of marketing all his fruit at

(Concluded on page 29.)

Red Raspberry Growing in Oregon

by Clayton L. Long

Oregon Agricultural College

ED SPATH is recognized in the northwest by the red raspberry growers as the grower to pattern after. He grows as high a quality Cuthbert and more of them to the acre than any other grower in the Pacific Coast states. This means he is the best raspberry producer in the United States. His average yield for the last four years has been three and one-half tons with an average gross income of $984.25 per acre, his yields varying from four and four-fifths tons in 1921 to two and one-half tons in 1922, the driest and hottest year the northwest experienced for a long time.

Ed, as all the growers know him, has been in the red raspberry game for 30 years. In 1893 ten and one-half acres of land in between two donation claims were taken up under the limitation laws by Mr. Spath. This land was all in timber. Five acres of cleared land were rented from a neighboring farmer and planted to red raspberries and blackberries the first year. The income from these five acres of berries, together with wages earned as a farm hand, took care of expenses while Ed cleared some of his land and prepared it for planting.

Ed. Spath of Gresham, Ore., in his high yielding field of red raspberries, showing his method of trellising. These raspberries are 25 years old.

In 1898, five years later, the first planting was made upon the home place. One and one-half acres of red raspberries, one acre of blackberries and two acres of loganberries were put in this year, and as Ed says, "This acre and a half of reds are among the best producing part of the farm today." Two years later two acres more were set to red raspberries. In 1902 two additional acres were set. This completed Mr. Spath's plantings until 1918. The acre of blackberries was removed and replaced with reds, and in 1922 the logans were plowed out and reds put in their place. An additional quarter of an acre was planted in 1918.

The five acres of small fruit on rented land were operated by Spath for five years. Working as a farm hand was continued off and on for about the same length of time. Growing hay and potatoes on rented land then followed as an outside source of income, and was continued until 1916. Thus the finest field of Cuthbert raspberries to be found anywhere was financed and started by the most progressive grower of the northwest.

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The Inside Story of the Apple

Part II.—The Formation of Fruit Buds

by J. R. Magness
United States Department of Agriculture

THERE appeared in our January number the first article of this series on "The Inside story of the Apple," and we had planned on running the second article in our February number but space did not permit. As our readers know, the February issue each year is devoted to sprays and spraying and we could not in that number find space enough for other material. The second portion of this series entitled, "The Formation of Fruit Buds," is therefore being published this month and Mr. Magness has informed us that there will be one or two more articles to complete the series.

IN THE January issue we discussed briefly the role played by leaves in plants—how water from the soil and carbon dioxide from the air come together in the leaves and how they are there combined by the action of light to form the sugars and starches, the so-called carbohydrates, which are so important to the plant. We mentioned briefly, also, the mineral materials which trees must secure from the soil if growth is possible.

This month we propose to study fruit bud formation in the apple to see where and when fruit buds are produced and what the conditions are which favor their formation. A knowledge of the factors which influence fruit bud formation, so far as these factors are known, is of fundamental importance to the orchardist, for all orchard operations should be carried out with the knowledge of their influence upon fruit bud formation clearly in mind.

The Importance of Fruit Buds.

By the term fruit bud we refer to those buds which develop within themselves, the flower parts—in other words, the buds which open as blossom clusters in the spring. These are contrasted to the leaf buds which do not form flower parts but which open in the spring, forming a cluster of leaves or a shoot rather than as blossoms.

The earliest beginning of the flower parts in fruit buds occurs long before any change in the bud can be detected by the orhardist. Careful study by means of a highly magnifying microscope of sections cut through the center of the bud is necessary to discern the earliest beginning of these flower parts. Such studies carried on in various sections of the United States, notably at the Oregon, Wisconsin and Virginia Experiment Stations, have shown that most of the buds begin the formation of flower parts in July and early August. Occasionally buds show flower parts developing even in early June, however, while other buds, particularly those borne on new wood, may not form flower parts until September. The date of fruit bud formation may then be said to extend from June to September, with the bulk of the buds first showing flower parts from the middle to the last of July.

Thus it is seen that the first critical period in the production of an apple crop occurs long before there is any apparent indication of such a crop in the trees. The period of fruit bud formation represents a truly critical stage in fruit crop production. If fruit buds fail to form there will be no blossoms and no crop the following year.

Consequently the orchardist must look ahead and must study his trees from the standpoint of the future as well as the present. Unlike a grower of grain or potatoes who can accept a bountiful crop with complete satisfaction, the fruit grower must remember that over-production one year will undoubtedly react to his disadvantage in years to come.

Location of Fruit Buds in Apples.

Any leaf or vegetative bud in the apple apparently has the inherent possibility of becoming a fruit bud when nutritive conditions within the bud become right. Because of the relationship of the nutritive conditions within the tree to the leaf area, however, it appears that only those buds closely associated with rather large, vigorous leaf areas are very likely to form flower parts and thus become fruit buds.

Buds in the apple may be divided into three groups. The first group includes buds formed along the shoots of any growing season. These buds are often termed axillary because of the fact that they are formed at the bases of the leaves or in the leaf axil. Each bud is normally subtended by a single leaf. The second group termed terminal buds includes those formed at the ends of shoots which have made a growth of several inches or more during the season. These buds usually are formed rather late and are usually surrounded by two or three large vigorous leaves. The third group of buds includes those formed on spurs by which we mean those parts of a tree which make a very short growth each season. These buds are usually surrounded by a cluster of leaves, ranging up to eight or ten leaves in number.

Flower parts may be formed in buds in any of these three positions. In axillary buds, those buds borne toword the tip of the shoot are usually much larger and appear more vigorous than those toward the base of the shoot, and it is these buds which usually form flower parts. Also the axillary buds of strongly growing shoots are larger and more vigorous than those on weakly growing shoots, and are more likely to form flower parts. Consequently axillary fruit bud formation usually occurs near the terminal of strongly growing shoots such as are found in young trees. Often a considerable portion of the first crops of certain varieties, such as Jonathan, Winesap, Delicious, Wagner, etc., is borne from these axillary buds. As the trees become well established in bearing and annual growth becomes less vigorous, the formation of axillary fruit buds becomes comparatively rare and unimportant.

Formation of fruit buds at the terminals of rather long shoots is less common than at the terminals of shorter shoots up to 15 inches in length. Production of fruit buds and fruit upon the terminals of these relatively short shoots is very important in certain varieties, such as Yellow Newtown and Grimes Golden.

During the second season the axillary buds which have not formed flower parts tend to push out into growth. The amount of growth varies largely with the position of the bud on the shoot and with the general vigor of the tree. Axillary buds near the base of shoots usually are weak and often remain entirely dormant during the following season. Buds toward the terminal give more vigorous growth, forming either new shoots, or what is more likely, vigorous spurs one-half to one inch in length. These spurs bear a cluster of leaves immediately surrounding the bud and thus the bud is in an ideal condition to receive the nutrient supply from the leaves which is so essential to fruit bud formation. It is upon these spurs, which continue to grow year after year, forming terminal buds with clusters of leaves surrounding them, that the great percentage of fruit buds and the main portion of the apple crop are produced.

Nutritive Conditions Associated With Fruit Bud Formation.

Fruit bud formation in the apple apparently is associated with a relative abundance of carbohydrates or food material from the leaves in comparison with the supply of nitrogen and perhaps other mineral materials which come from the soils. Much has been written during the past seven years since the theory was first elaborated by Kraus and Kraybill in a bulletin from the Oregon Experiment Station concerning the carbohydrate-nitrogen ratio relationship to fruit bud formation in apples. Both chemical analyses and the results secured from experiments on defoliation of trees, girdling of branches, etc., bear out the original results of these investigations. Fruit buds are apparently developed as a result of an abundance of carbohydrates in proportion to nitrogen in the buds in which the flower parts develop.

The time of the formation of fruit buds is particularly important when considered in the light of this nutrient condition. Chemical analyses have shown that there is often a dropping off in nitrogen in spurs and buds from spring until midsummer. During this same period there is a constant expansion in leaf area. As a result, we have by July 1 a combination of a drop in nitrogen present in the buds while the carbohydrates from the leaves are present in abundance. By that time practically all the leaves are fully expanded, the days are long, so the leaves, whose activity it is recalled is dependent upon light, have a maximum period each day to produce carbohydrates. As a result of these conuitions, we find in midsummer a relative abundance of carbohydrates in the trees unless they are being utilized in other ways. If there is a very heavy crop of growing fruit on the trees, however, or if the tree itself is growing vigorously as in the case of young orchards, the carbohydrates from the leaves may be largely consumed in the growth of the fruit or tree. In this case they may not become sufficiently abundant to result in fruit bud formation.

Relation of Fruit Bud Formation to Spur Growth.

Roberts, of the Wisconsin Experiment Station, has pointed out that there is a close association between the amount of foliage or leaf area on a spur and the growth of that spur. Spurs growing less than one-eighth of an inch per season had much less leaf area than spurs making one-fourth to one-half inch of growth. Longer spur growth carries even greater leaf surface but on very long growth the leaf area is more widely distributed since all the leaves do not immediately surround the bud. He found that spurs that grew one-fourth inch per season or over were far more likely to form blossoms and bear fruit than were those making less growth and consequently carrying fewer leaves. This indicates what other experiments have shown, namely, that each spur or bud is, to a considerable extent, dependent upon the leaves closely adjacent to it for its nutrition. If the leaves about any bud are removed, that bud will probably fail to form flower parts that season, and if the leaves from a considerable portion of a tree, as, for example, one complete branch, are removed in the early summer before fruit bud formation has occurred, no fruit buds will form upon that branch.

While these results indicate that the influence of leaves is quite local and that buds are, to a considerable extent, dependent upon leaves adjacent to them, the fact remains that there is a marked influence of the tree as a whole upon the response of the buds. While it is true that when only a moderate number of buds are forming flower parts on a tree these buds are mainly those on spurs making a good growth of one-fourth to one-half inch and are thus carrying a large leaf area, the fact remains that certain trees in certain seasons have flower parts forming in almost every bud regardless of the leaf area immediately surrounding it. Also, in certain trees some seasons there may be no fruit buds formed regardless of length of growth of spurs. Thus, to a certain extent, the tree acts as a unit so far as the nutrient ratio is concerned. If there is a very great abundance of carbohydrates in the tree as a whole, buds will undoubtedly form flower parts which would not do so if they were entirely dependent upon their own leaves. On the other hand, if the carbohydrates in the tree as a whole are depleted, due to a heavy crop of fruit or some other cause, fruit buds may not form even on spurs well equipped with leaves. In those trees intermediate between these extremes, which are bearing a fair crop of fruit but also are in a condition to form a certain number of fruit buds, it is in the buds which are directly associated with the largest and best leaf area that the flower parts are formed.

We know too little concerning the movement of material in the tree to interpret accurately the extent to which food materials are utilized near or at their source of manufacture. A conception which appears to explain accurately many of the known facts is that the soluble food materials gradually move in the tree from those points in which they are highly concentrated or most abundant to points where the concentration is lower. Thus a group of leaves about a bud would be constantly supplying carbohydrates to this region and they would be very abundant. If the concentration of carbohydrates in the tree as a whole was high, these substances would remain near the leaves, and the buds surrounded by a group such as these would become a fruit bud. If the tree as a whole, nowever, was very low in carbohydrates, these substances would move away from the immediate region of the leaves rather rapidly. In that case, while the concentration about the individual bud surrounded by these leaves would still be higher than the concentrations in the tree as a whole, it might not be sufficiently high to result in the formation of flower parts of the buds.

If leaves were removed from a spur in a tree having a large carbohydrate supply, the movement would tend to be from the remainder of the tree to the defoliated spur, since such a spur would be low in carbohydrates. Such a spur would still be lower in carbohydrates than surrounding spurs not defoliated, however, since otherwise movement toward it would cease; hence it would be less likely to form

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Our Editorial Comment

Our Federal Land Banks

THE 64th Congress, in April, 1916, passed the necessary legislation to establish Land Banks calculated to assist the farmer by providing capital for loaning exclusively to the farmer. The act provided that the country be divided into 12 districts and that a Federal Land Bank be established at some advantageous point within each district.

The basis upon which these banks are financed is by the sale of Federal Land Bank Bonds. A minimum of $750,000 of these bonds were required to be sold before a bank could be opened for business.

The shares of the Land Bank have a par value of five dollars and share in any dividends declared. Upward of $42,000,000 of these securities have been sold by the 12 district banks and all, except $2,400,000, have been purchased by the farmers themselves through their local associations. After paying the costs of operation and setting aside necessary reserves, all profits are returned to the borrowing farmers through their local associations. To date, over $7,000,000 has been paid as dividends.

Federal Land Banks are located in the following cities: Springfield, Mass.; New Orleans, La.; Wichita, Kan.; St. Louis, Mo.; Berkeley, Calif.; Omaha, Nebr.; Louisville, Ky.; St. Paul, Minn.; Baltimore, Md.; Columbia, S. C.; Houston, Tex.; Spokane, Wash. Present resources over $880,000,000.

More than 300,000 farmers are now borrowers from these banks. Loans are made to assist the farmer in liquidating mortgages carrying higher interest rates or embodying undesirable terms or conditions; for purchasing more land for agricultural purposes; for farm equipment such as mowers, reapers, harvesters, etc.; for fertilizers and for livestock; for buildings that will improve the property. The loans are limited to 50 per cent of the value of the land plus 20 per cent of the permanent insured improvements and run for not less than five years. The interest rate must not exceed six per cent per annum. A Federal Land Bank mortgage need never fall due. It is gradually retired by the semi-annual payment of a uniform sum, equal to the interest on the amount borrowed plus one-half of one per cent of the loan. For example, the farmer with a mortgage of $1000 at six per cent pays $35 every six months. This includes the interest and a payment on the principal sufficient to cancel the loan in about 33 years.

As an adjunct to the Federal Land Bank and to bring it into more intimate touch with farm communities, the law provides for the formation of National Farm Loan associations, of which there are more than 4500 at the present time. These may be formed anywhere by 10 or more farmers who desire to become borrowers. Application is made to the Federal Land Bank in whose district the group resides for authority to organize the association. The officials are the same as for any banking institution, the secretary-treasurer being the only one drawing a salary. After organization the prospective borrower makes application to the association. A committee of non-borrowing members is then called upon to appraise the value of the properties upon which the loans are to be made and the facts sent to the District Federal Land Bank. When the loans are approved the borrowers must purchase stock of their local association to the value of five per cent of the loan to be made before they are paid the money involved in the loan. The association in turn invests the share money in stock of the Federal Land Bank serving that district.

Federal Land Bank bonds are free from all taxes. Even the interest on the bonds is free from income tax. They provide a safe investment for the surplus funds of the farmers and they should buy them in preference to the haphazard assortment of securities offered by bond houses. Millions of dollars are lost annually by farmer-investors who are inveigled into the purchase of oil stocks and industrial bonds because of the promise of greater returns. Far better had these investors been satisfied with the lower interest rate and the absolute safety to the principal invested. Farm Loan Bank bonds may be turned into cash whenever necessary. The interest is paid semi-annually and the bonds may be had in denominations of $40, $100, $500, $1000, $5000 and $10,000. Each bond has at its top the words, "The Federal Land Bank," which enables the buyer to quickly identify the genuine security. They may be had in either coupon or registered form, as desired.

Farmers should foster and support this institution as it is the only national co-operative lending and investing organization in the country. It is literally the farmers bank as its name implies. When you have money to invest you should support this co-operative Farm Loan System by investing in Federal Land Bank Bonds. This can be started with a single Bond—$40, $100, $500, $1000, $5,000 or $10,000—and increased as the money can be spared. These bonds are safe. No investor in them has ever lost a dollar. They are free from all taxes, except inheritance taxes. This applies to both principal and interest. Should you need money quickly, these bonds command a ready market, or your banker will accept them as security for a loan. You can buy these bonds from any Federal Land Bank or from the Fiscal Agent. The Bonds will be sent by registered mail. All correspondence confidential. Remember that the words, "The Federal Land Bank," appear at the top of every Bond issued by a Federal Land Bank.

A new $60,000,000 bond issue, permitted under the recent amendment to the Federal Farm Loan Act, is just being put out through the 12 Federal Land Banks which are all on a dividend paying basis.

More complete information may be had by sending for the pamphlet entitled, "Getting together to get ahead." Address the Fiscal Agent, Federal Land Banks, Washington, D. C., or any of the Federal Land Banks named above.

Our Orchard Equipment

AN EXTENSIVE educational program has recently been started by the National Association of Farm Equipment Manufacturers, the main purpose being that of bringing producer and consumer into closer contact. A campaign of this kind giving the agriculturist first hand information is bound to bring about a better understanding. The evolution from the pioneering blacksmith shops' products to the modern standardized products we use today in our orchard work is just one of the romantic developments in American agriculture. Probably no industry is more closely allied to agriculture than the implement business, and the great dealer organizations that spread over the entire country give the user special service on the newer and more effective equipment which is probably not surpassed by dealer organization of any industry.

Practically every piece of orchard equipment has been introduced and made possible because of this dealer service. In these days of high labor costs, up-to-date equipment involving the necessary mechanical power is being used more and more and both factory and dealer are being called upon for greater service. The overhead cost of a bushel of peaches, a box of apples, a basket of grapes, etc., must be cut to the minimum figure.

Use of Electricity by the Fruit Grower

THERE has been a noticeable electrical development in recent years in the homes and on the acres of the agriculturists, and particularly is this true with the more than 250,000 commercial fruit growers of the United States. In the nature of their strenuous occupation they must be ever alert and progressive. The many applications of electric current to power and safe lighting and heating purposes naturally appeals to these men of discernment, who have a substantial investment in their rapidly expanding and improving industry. No surer sign of the wise and far-seeing—and this means successful—orchardist is to be found than in his prompt and thorough utilization of the many advantages of electricity. This applies to the home as well as to the out-buildings and acres under cultivation. Homes of fruit growers are rapidly becoming possessed of modern electrical conveniences, and in numerous instances are served economically by long distance electric power transmission lines and when necessary by the installation of their own generating sets. The enterprising manufacturers of suitable electrical apparatus recognize this comparatively new and active field, and we welcome their assistance in making the country home and pursuits more comfortable and more attractive.

In this relation we quote from a recent address by Hon. Herbert Work, our Secretary of the Interior, which applies to the orchard home quite as much as to farms:

"One of the most advanced movements of this time is the campaign to introduce motor-driven labor-saving machinery into the farm home for the relief of the women there. Originating as an economic conception, the resulting conservation of women will have a direct reflection on race improvement. Out of it should come the reading mother; the home teaching of children; a more hygienic environment; a better physique; a stronger mentality; a responsible moral sense, and finally, the nation's greatest present need—contentment of mind and time for reflection. The modern American home is not found in the cities. It must be men who will do the thinking of this great nation.

"I would make a plea for the farm family unit, for the 6,000,000 of women on farms, that their load might be lightened, their hours shortened, recreation enjoyed and their minds rested; that they be helped to take their place as character builders, to build the home life around them."

From a recent statement by M. H. Aylesworth, Managing Director of the National Electric Light Ass'n, it appears that 400,000 rural establishments in the United States already have the benefits of electricity in some form, and he estimates that more than 500,000 additional country homes will be using electricity within the next seven years. The National Electric Light Ass'n, undoubtedly the most powerful and influential organization in the advanced and advancing electrical industry, recently established headquarters in Chicago, where, through co-operation of the American Farm Bureau Federation, the Society of Agricultural Engineers, the Department of Agriculture and some of the agricultural colleges, it will carry on its educational campaign. This progressive out-reach of this important association is to be most highly commended. Its good effects will be promptly felt throughout the farm life of the nation.

We respectfully urge our readers in the fruit growing industry to give constant and favorable consideration to the many aids to labor and comfort to which electrical science invites them.

XUM

Pruning the Apricot

by Warren P. Tufts

University of California

OF ALL the different species of deciduous fruit trees grown in California, there is probably no other single kind that is pruned by so many and diverse systems as is the apricot. Although generalizations are dangerous, the statement will be hazarded that in a state where heavy pruning has been the commonly accepted method, the apricot has in most sections been the most severely cut of all the deciduous fruit trees. This fact is especially true of the oldest apricot sections, including Santa Clara Valley, Winters, Vacaville and Suisun. Orchardists in these districts have almost uniformly heavily pruned apricot trees of all ages. In order that this article be kept within reasonable bounds, it seems desirable to discuss the pruning of non-bearing and bearing trees separately.

Pruning the Young Tree.

The cutting of young trees is primarily designed to influence the form. However, the functions of the plant are also profoundly altered. "If you would have your trees stocky, strong, and mechanically able to support heavy crops, prune your orchard severely for at least four years after planting," has been the advice commonly heard in nearly all deciduous fruit growing sections of California. When it is remembered that a very large percentage of the food materials utilized by the plant in building its framework and fruiting machinery the spurs and shoots come from the air and that this growth is dependent upon leaf area, then it would seem very unwise to annually remove a large proportion of the leaf bearing area of the tree. In addition, this heavy cutting removes from the plant stored food reserves.

Growers have been misled by the fact that as a usual thing heavy cutting is followed by an exuberant shoot growth the following season. Recent investigations by the California Experiment Station, however, have shown that shoot growth alone is not a true index of plant vigor. It is far more accurate to measure the tree's activity by the weight of wood laid down over the whole plant. It is, of course, impossible to take a tree up and weigh it at stated intervals but unfortunately there is so close a correlation existing between trunk circumferences and total weight of both top and root of the tree that such a proceeding is unnecessary. Any pruning practice which gives a greater girth in the young tree may be safely taken as an index of larger development over the entire plant.

TABLE I.—INFLUENCE OF PRUNING UPON STOCKINESS OF APRICOT TRUNKS AND BRANCHES.

	Pruned Severely.	Pruned Moderately.	Pruned Lightly.
Trunks	11.7 cm.	12.6 cm.	15.3 cm.
Branches ..	3.85 cm.	4.66 cm.	5.09 cm.

Having these facts in mind, the results of certain pruning experiments are given in Table 1.

The differences here recorded were after only one year's treatment. The experimental trees were planted in deep, rich, alluvial loam soil, had not been irrigated up to the time these measurements were made, and with the exception of the pruning, received identical cultural treatment. Measurement of trunk circumferences were made about four inches above the ground in order to avoid the swelling near the bud union and to be below all branches. The branch measurements were made at a height of three feet from the ground, the trees having been evenly headed at time of planting.

The facts just recorded are in exact accord with the results of similar experiments in England, Germany, New York, Oregon, West Virginia and other sections, which show that the less a young, non-bearing tree is pruned the larger and heavier it grows.

The spread and depth of the roots of trees receiving different pruning treatments show, in general, a restricted or limited root system that is directly proportionate to the severity of the pruning. Stated in another way, the total weight of the tree and all its parts (top, roots and prunings) is inversely proportionate to the severity of the pruning it has received.

Table 2 figures are based on the average of a score or more of trees actually dug up and weighed. It will be noted that the weights of prunings are not directly correlated with the treatments.

TABLE II—INFLUENCE OF PRUNING UPON TOTAL DEVELOPMENT OF TREE.

Three-year-old Nonpareil Almonds.

	Pruned Severely.	Pruned Moderately.	Pruned Lightly.
Weight of prunings.	9.7	11.0	8.5
Weight of top.....	19.7	37.0	39.5
Weight of roots.....	16.9	30.3	32.5
Total weight.....	46.3	78.3	80.5
Spread of roots.....	9.8	12.7	15.5
Depth of roots.....	5.0	5.5	4.7

Weight in pounds, length in feet.

The figures for the weight of the tops remaining after the pruning, show a definite correlation with the pruning treatment, that is, the lighter the pruning, the heavier the top. This same statement holds true for the weight of the roots. Some growers have been of the opinion that although a "thinning-out" favors the development of the top, a severe cutting back of the new shoots each year, while the tree is young, is necessary to promote strong root development. The data here presented indicate that the contrary is true, a heavy pruning results in a comparatively small root system.

The spread and depth of the roots of the trees receiving different pruning treatments show, in general, a restricted or limited root system that is directly proportionate to the severity of the cutting.

The above data have all been presented with the purpose of calling to mind principles which apply with equal force to all kinds of young deciduous fruit trees.

In March, 1916, the writer planted 196 Royal apricot trees in the University Orchards at Davis. Sixteen different treatments were planned for these trees and have been carried out now during the past six seasons. In brief, these treatments consisted of different degrees of severity of pruning, at the same time taking into consideration the season of pruning. The following table briefly summarizes the results obtained so far as the first few crops are concerned.

TABLE III—BRINGING THE APRICOT INTO BEARING—ROYAL APRICOTS PLANTED MARCH, 1916.

Pruning Treatment.	1918.	1919.	1920.	1922.	Total.
Heavy Heading—					
Yield	0.0	0.4	0.7	23.9	25.0
Size	...	9.2	19.3	8.3	
Light Heading—					
Yield	1.6	20.7	56.6	162.8	241.7
Size	...	8.5	8.6	12.2	
Thinned only—					
Yield	3.3	24.9	53.1	200.6	281.9
Size	...	9.4	9.7	13.4	
Moderate Summer—					
Yield	0.6	2.2	21.9	200.1	224.7
Size	...	9.1	12.0	11.9	

Yield—Average per tree in pounds.
Size—Number of fruits per pound.

No yield records are available for the season of 1921 on account of a heavy frost which destroyed the entire crop. At six years of age, the heavily headed trees had not as yet come into good bearing: the lightly headed and thinned trees began producing at three years of age and the summer pruned trees a year later.

From the figures presented, there is apparently little difference in the yields obtained except as regards the plot which received the heavy dormant pruning. Inasmuch as these trees have up to the present time been largely pruned to regulate the form rather than to produce a crop, too much stress should perhaps not be laid on yield data.

As noted in the opening paragraphs of this paper, lighter pruning is conducive to wood growth and measurements and observations in this orchard bear out this statement. The only just way to judge the merits of the different treatments is to study the individuals in the field. A brief word or summary, however, will not be out of place.

The heavily headed trees have made an excessive wood growth each year, thus shading out the fruiting wood in the lower parts of the trees. This explains in part their non-production. The main branches are covered with wounds and do not present the round smooth surface which is so desirable.

The lightly headed trees have borne

(Continued on page 44.)

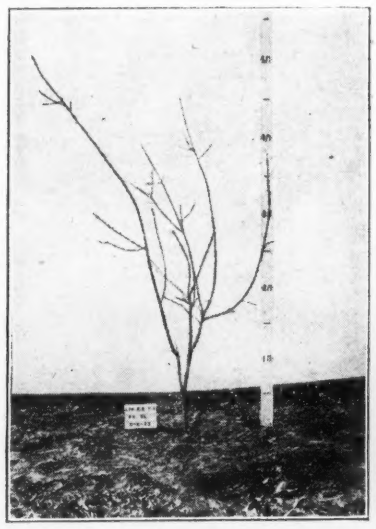


Fig. 1—A well-grown one-year-old apricot tree before pruning.

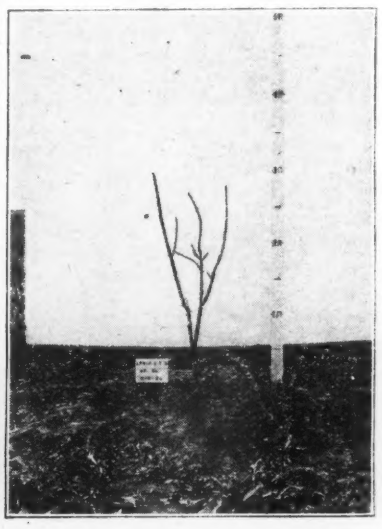


Fig. 2—The same tree as shown in Fig. 1 after pruning.

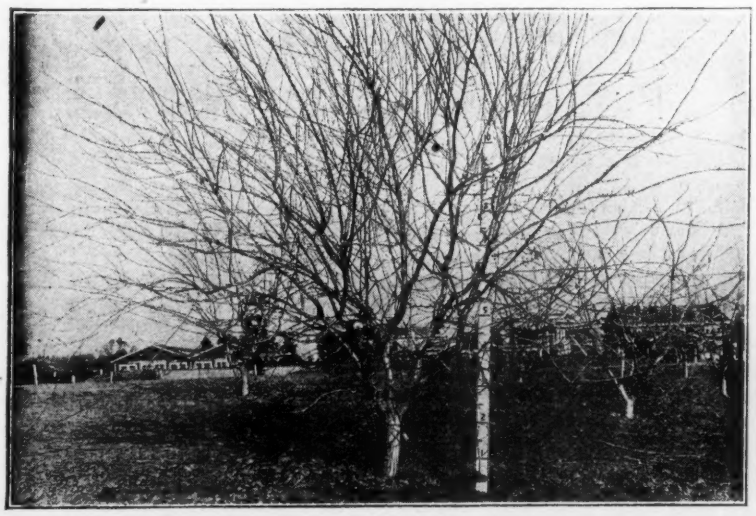


Fig. 3—A four-year-old apricot tree before pruning. Note thick, bushy appearance, indicating a satisfactory vegetative condition since this tree was severely thinned out at the last annual pruning.

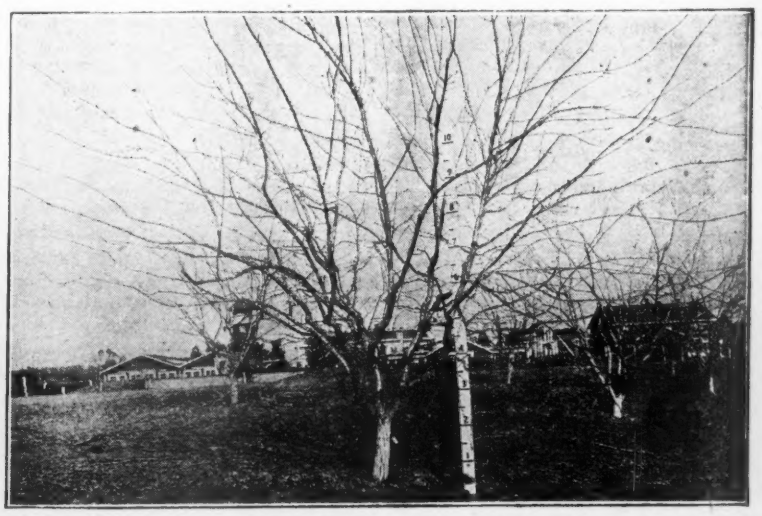


Fig. 4—The same tree as shown in Fig. 3 after being pruned by a rather heavy thinning. It should be noted that apricot trees pruned after this fashion have a large amount of wood removed annually.

Control of the San Jose Scale

by A. J. Ackerman
United States Department of Agriculture

THE SAN JOSE scale has been the most destructive pest of the apple in the Ozarks during the past three years. In this period the annual loss of trees and fruit, caused by the attack of this insect, has been enormous. While the San Jose scale has been present in the apple sections of the Ozark region for many years, it is only within the last few seasons that it has developed into a serious menace to apple growers. In 1920 this insect was abundant in several orchards in northwestern Arkansas, but it was not until the following year that fruit growers really became alarmed over their inability to hold this pest in check. By 1922 serious infestations of the San Jose scale had developed in several neighboring states of the Mississippi Valley.

Cause of Scale Increase.

Some of the reasons for the rapid and destructive increase of the San Jose scale in the past few years have been carelessness in spray methods, long, warm growing seasons favorable for the increase of the insect, and a reduction in the natural enemies of the scale.

In the past, one thorough dormant spray with liquid lime-sulphur solution always controlled the scale satisfactorily. When the scale first began to increase some growers were careless in the application of their sprays. Tips of branches, especially in the tops of trees, were often missed and scale infestations started at those points. Many growers hurried their spraying operations to such an extent that the covering of spray material was insufficient to insure a thorough coating of all parts of the tree, which is very essential in the control of heavy infestations of the San Jose scale. At the time of the spring dormant spray, rainy weather and high winds often interfere with the spray application, with the result that growers rush their spraying to finish before the leaves come out.

The lack of a sufficient number of parasites and the scarcity of predacious enemies of the San Jose scale has been another important reason for the rapid increase of the insect. This, together with a long favorable breeding season, has tended to cause an unusually rapid increase in the scale infestation. Where a few scales escaped the dormant treatment, they increased to such numbers by late fall as to be scattered all over an orchard.

The apple varieties most severely injured by the San Jose scale are Grimes, Ben Davis, Gano, Western Beauty, and Oliver. Some of the moderately susceptible varieties are Early Harvest, Arkansas (Mammoth Black Twig), Ingram, Jonathan and Maiden Blush. Arkansas Black, Winesap and Givens are rather resistant to scale attack.

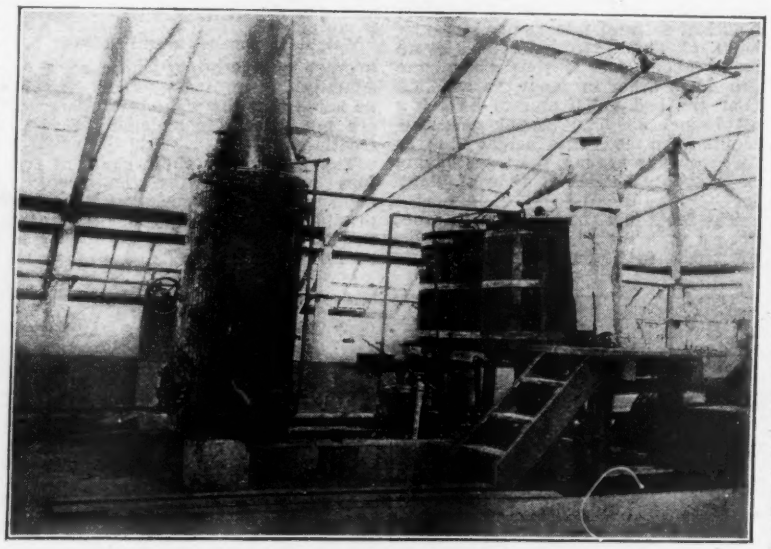
Control Measures for San Jose Scale.

The usual control procedure for this scale insect has been an annual dormant spray with liquid lime-sulphur solution or with a miscible oil spray. When the scale first began to increase, two dormant sprays were more frequently applied, one in the fall after the foliage was down and a second in the spring. In addition, many growers increased the strength of the spray solution from the recommended 25 gallons of 33-degree Baume lime-sulphur solution to as much as 35 or 40 gallons in a 200-gallon spray tank. In spite of this, the majority of growers failed to obtain a satisfactory control of the scale. On incrusted trees enough scales escaped to provide breeding stock for the following season. Only a few growers were able to control heavy infestations of the scale with two thorough applications of lime-sulphur solution. The expense involved in making two dormant sprays with lime-sulphur solution, together with the unsatisfactory results obtained, led the Office of Fruit Insect Investigations of the Bureau of Entomology, United States Department of Agriculture, to investigate the control of the San Jose scale in the fall of 1921.

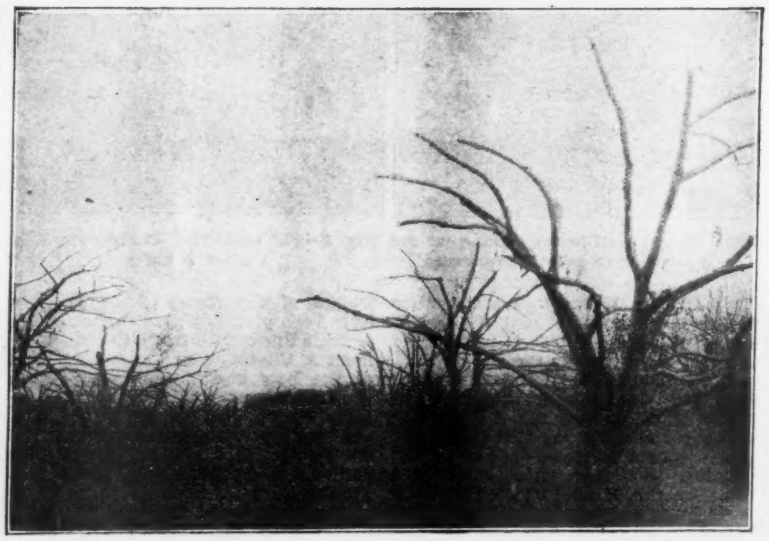
Control Experiments.

Tests were made with three different brands of commercial liquid lime-sulphur solution, several brands of dry lime-sulphurs, kerosene emulsions, a proprietary miscible oil and several different strengths of lubricating-oil emulsion containing from two to eight per cent of oil.

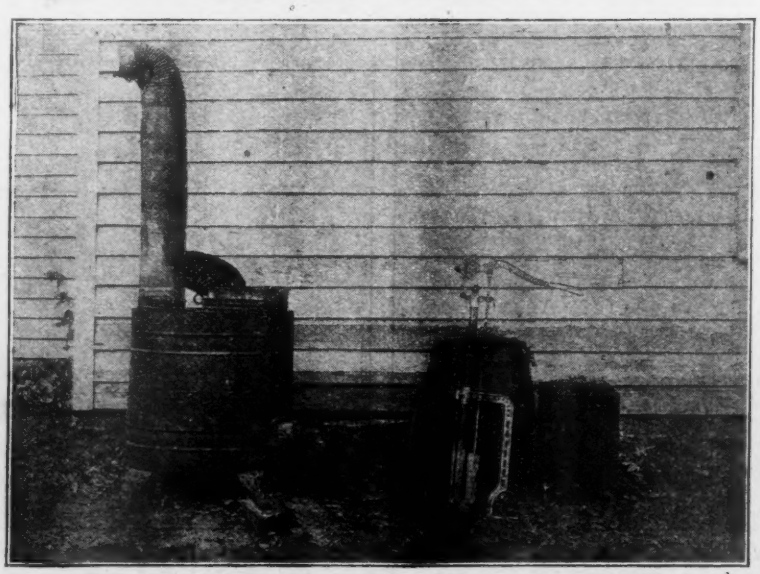
Of all the insecticides used in the experiments, best results were obtained with lubricating-oil emulsion.



A convenient outfit for making lubricating-oil emulsion.



An orchard killed by the San Jose scale.



Equipment for making small quantities of oil emulsion.

An emulsion containing two per cent of oil was just as efficient as the stronger dosages, virtually one hundred per cent of the scale insects being killed. The twenty per cent and twenty-five per cent kerosene emulsion plats showed a killing of 96 per cent and 98 per cent of the scales, respectively. The miscible oil gave about the same results as the 25 per cent kerosene emulsion. The best killing that was secured with any of the liquid lime-sulphurs was about 90 per cent. The dry lime-sulphurs, both at label-recommended strength and at twice label-recommended strength, were less effective than liquid lime-sulphur solution.

Oil Emulsion in Commercial Orchards.

Following the experimental work, a large number of fruit growers began to use lubricating-oil emulsion for the spring dormant treatment in 1922. A two per cent emulsion, or six gallons of stock in a 200-gallon spray tank, was the strength used by practically all growers. A very satisfactory control of the scale in commercial orchards was obtained with lubricating-oil emulsion in the spring of 1922. The San Jose scale was brought under control in orchards in which it had been increasing gradually in previous years in spite of dormant spraying. While the scale was by no means eradicated at that date, growers felt more optimistic of their ability to hold it in check than heretofore. Examinations of twigs from a large number of oil-sprayed orchards showed just as good killing of scales as was effected in the experimental spraying. Occasionally a few live scales were found in protected places, such as crevices on the fruit spurs or in deep depressions or cracks from old hail bruises. Of course, some trees were not covered completely with the spray solution, and missed spots showed live scales.

Since no injury developed to trees sprayed with lubricating-oil emulsion following its use the first season, this insecticide came into general use as a dormant spray in the fall of 1922 and in the spring of 1923. Fully 95 per cent of the apple orchards of Benton and Washington counties, Arkansas, received a treatment with this insecticide during the last dormant season. Very favorable reports of the control of this scale insect with oil emulsion have been received from several other states where the San Jose scale has been on the increase.

At the present time apple growers of northwestern Arkansas are convinced that a thorough dormant spray with lubricating-oil emulsion will control the San Jose scale fully as well as any other insecticide known. Instead of being threatened with the loss of their orchards, growers no longer fear the scale. There were numerous instances where fruit free from scale spotting was harvested last fall from orchards which, a year or two previous, were thoroughly incrusted with the scale.

Summer Sprays.

A combination spray of oil emulsion and summer strength lime-sulphur solution by the addition of a stabilizer has been tried for the "cluster-bud" application. This combination spray was used to control apple scab and light infestations of the scale by a single application. Some rather severe cases of injury to foliage and fruit clusters developed from the combination of stabilized oil emulsion and lime-sulphur solution. It is not advisable to attempt to control the scale in the "cluster-bud" spray because, as a rule, time does not permit for thorough enough work to kill a high percentage of scales. Furthermore, two entirely different control problems are presented; in spraying for apple scab it is important to wet only the foliage and fruit clusters, while in spraying for the scale all parts of a tree should be wet with the spray solution.

Lubricating-oil emulsion (a two per cent emulsion added to the regular

(*Concluded on page* 47.)

A Giant Who Works For You

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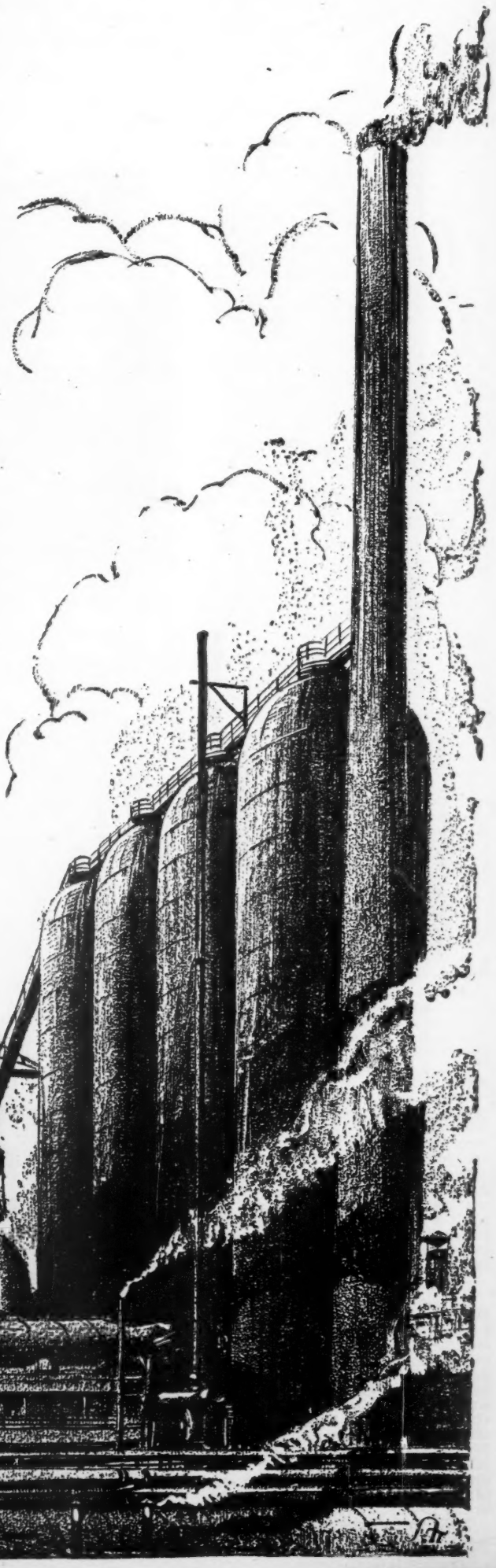

Ford River Rouge Blast Furnaces produce twelve hundred tons of molten iron a day.

XUM

Frost Protection for California Citrus Orchards

by W. R. Schoonover
University of California

AMONG the half dozen cultural practices essential to success in raising citrus fruits is protection of the trees and fruit against unfavorable weather conditions, such as winds, freezes, etc. Frost protection has, therefore, assumed a large importance in citrus orchard management and by frost protection we ordinarily mean heating with a large number of small heaters scattered throughout the orchard.

Insurance should not be looked upon as a protection, as it merely reimburses the grower for part of his loss and does not save either crop or trees. The writer does not believe in frost insurance except as a temporary measure for those unable to buy heaters. Insurance costs as much as heating and the latter method really saves the crop. If the growers insure rather than heat, they permit the community to suffer a serious loss and many people who make their living by packing and handling fruit suffer.

There are two phases to protection of orchards by heating; first, preparedness before cold weather sets in and, second, a good organization for firing and refilling. Full preparedness is more than half the battle, for nothing short of adequate protection will help. Lots of orchards have been heated thoroughly through two nights of a freeze and then had the fruit frozen on the third night and all of the effort wasted. The first thing required is a supply of heaters. The only principle thus far successfully demonstrated in frost protection is heating the air of the orchard with a large number of small fires per acre. Air stirring devices, central heating plants, smoke screens and many other ideas have been tried with little or no success. What is needed is a large volume of moderately heated air distributed throughout the orchard and the only possible way to get this is through the use of a large number of small heaters.

The main requirements for a heater are that it burn the grades of fuel obtainable for several hours with only the initial regulation and that it have sufficient capacity to burn eight or nine hours, at least, without refilling. In many districts there is the additional legal requirement that the heaters be of the so-called smokeless types.

Three Types of Heaters.

While many types of heaters are still in use the manufacture has narrowed down largely to three kinds.

First—An oil burning heater with a medium tall stack and down draft. This type gives good combustion and little smoke and is represented by the heater designed by a committee from the California Fruit Growers' Exchange.

Second—A short stack oil burner with down draft. These heaters give excellent results and are somewhat cheaper in first cost than those with tall stacks, so they are used in many outlying districts where smoke is not prohibited.

Third—Briquet burners. These are small heaters with a grate for burning solid fuel. They are fine for small growers who do not want to be bothered with handling oil and are effective but slower in attaining full heat.

Number of Heaters Required.

For medium cold locations, from 50 to 100 heaters per acre will be required. The number varies with the location and the fuel capacity. A grower would not be justified in feeling safe without enough heaters to have at least 400 gallons of oil per acre in the heaters at the beginning of each cold night. This would mean about 60 of the seven-gallon size or 50 of the common nine-gallon size. If solid fuel is used, one 20-pound heater per tree will be needed and two tons of briquets per acre near the heaters in the field.

Orchards on level ground are more easily heated than those on slopes and heaters can be placed in every other row. If there is an appreciable slope, there will generally be a drift of air down the hill, so a double row of heaters should be placed on the outside of the upper row of the orchard and the heaters so placed in

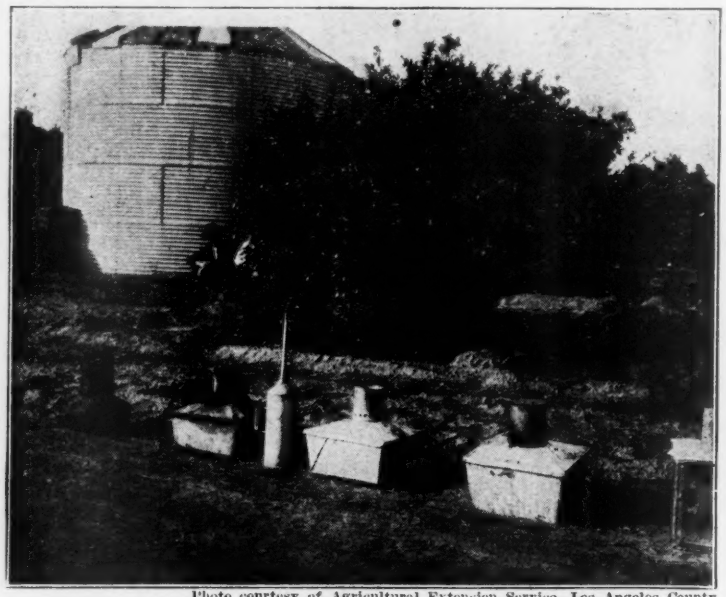

Photo courtesy of Agricultural Extension Service, Los Angeles County.
Two types of low stack orchard heaters and lighting torch.

the row that the drift of air will be through the trees. Heaters should never be placed under the trees as the drying out effect on the leaves and twigs is harmful. The heaters should be put in such a position that they can remain in the field from November to May, if necessary, without interfering with cultural operations any more than necessary.

Torches are required for lighting

Photo courtesy of Agricultural Extension Service, Los Angeles County.
Latest form of medium stack heater, known as the "Supply Company" heater, designed by a committee of growers. Oil storage tank in background.

the heaters. These should be of a kind which will drip fire. They are filled with a mixture of equal parts of kerosene and gasoline. Three or four torches should be on hand and ready for each 10 acres of orchard, and at convenient points additional torch fuel in containers should be ready.

The Fuel.

The fuel most commonly used at present for oil heaters is a distilled oil of 28 to 35 degrees gravity and containing one per cent or less of asphaltum. The better types of heaters will burn crude oil straight but a distilled product, meeting the above specifications, will be much more satisfactory. As mentioned above, the amount of oil actually in the heaters in the field should be about 400 gallons or more per acre. There should be a reserve supply of oil at the orchard or within convenient hauling distance for three fillings of the heaters.

One of the great difficulties in conducting a successful orchard heating campaign is to get the pots filled rapidly after a night's use. The work will be greatly facilitated if oil is stored at an elevation so that it will flow from the storage tanks to the tank wagons by gravity. If pumping must be done, a motor driven pump will facilitate the work. It is poor policy to have a tank so placed that oil must be pumped by hand during a busy day when the heaters must be filled before night.

Oil is distributed from the storage tank to the heaters by tank wagons holding approximately 500 gallons. As the tank wagon is driven down the row the heaters may be filled through hose or with filling buckets. Each system has its advantages. A team and tank wagon with three men can put out about 4000 gallons of oil a day or sufficient for 10 acres if the heaters have been burned entirely dry.

Several Thermometers Are Necessary.

An important part of the equipment is a thermometer. Perhaps the most satisfactory type is what is known as a horizontal alcohol minimum thermometer, costing about $3. These are ordinarily very accurate and are tested by the Weather Bureau so that the growers may depend upon them. Each grower should have at least three of these thermometers, two in the heated area and one outside for comparison. Thermometers will not read the correct temperature unless properly sheltered so that the bulb is protected from radiation of the sky and also against the formation of dew. A satisfactory thermometer shelter is shown in an accompanying illustration. These shelters should face the north and the thermometer should be four and one-half feet from the ground. It is perfectly satisfactory to have a shelter underneath the leaves of a tree.

Some growers like to have an automatic alarm to call them when the temperature drops near the danger point. These are all right if kept in good condition but one ought not to trust to a single alarm as the crop might be lost through failure of one instrument. The most satisfactory arrangement is for growers to form associations and hire watchmen to read the thermometers on a designated beat and call the growers when the danger point is reached.

All of the above mentioned equipment should be in place in the fall, at least by November 15. The heaters should be ready in the field and should be wicked. If a tall stack type of heater is used a piece of shook rope placed in the draft opening forms a satisfactory wick. For the short stack type, a loose wad of excelsior stuffed into the stack and just touching the oil is very satisfactory. After the heaters are in the field, it is a good practice to examine each one of them to see that the drafts are not stuck and that the heaters are in order for instant operation.

Summary of Equipment Needed.

A summary of the equipment required for a 10-acre orchard follows:

Equipment for Heating 10 Acres of Oranges.

500 9-gallon heaters	$1,500.00
3 minimum thermometers	9.00
1 463-gallon wagon tank	98.00
4 filling buckets	16.00
3 torches	7.50
1 300-barrel storage tank	350.00
	$1,980.50
300 barrels of oil in storage	350.00
5 gallons lighting fuel in container	1.00
	$2,331.50

With the equipment in place and everything set for firing, the next thing is to be organized for speedy firing when the cold weather commences.

Three or four men will be required for each 10 acres to take care of the firing at night and the filling the next day. High school boys frequently do this work; also pickers and packers from the packing houses. The laborers are ordinarily paid a dollar for being called out and then a fixed price per hour for the time they are at work; filling comes at the regular day labor rates.

Growers Should Have Knowledge of Weather Conditions During Freezes.

In order to fire successfully the grower should have some knowledge of the weather conditions in his district during the average freezes. Farmers' Bulletin No. 1096 of the United States Department of Agriculture prepared by Floyd Young of the

(*Concluded on page* 12.)

For You and for Your Family
This book has been carefully prepared for you and for your family. It presents our merchandise to you honestly. It brings to you and to your family all of the advantage, all of the saving made possible by our 52 years experience in securing bargains for you.
At Montgomery Ward & Co. we believe that we owe a duty to our customers—a duty to you. We believe it is our duty to offer only reliable goods of standard quality, and always at the lowest possible prices.
That is our duty to you—and that is the policy of Montgomery Ward & Co. today. And that policy has been conscientiously carried out in this catalogue —for you and for your family.
Catalogue Number 100
Spring and Summer 1924
ESTABLISHED 1872
The Oldest Mail Order House Is Today the Most Progressive
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Chicago

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Ward's new complete catalogue for Spring and Summer is now ready, and one free copy may just as well be yours.

The opportunity for Saving, for wise buying is *at your door*. It is for you to give the answer. Will *you*, too, save money this Season on nearly anything *you* buy?

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We sell only the kind of merchandise *that will give you satisfaction*—that will stand inspection and use. We do not sell "cheap" goods. We sell *good* goods cheap. At Ward's we never sacrifice quality to make a low price.

And that has stood as our governing policy for fifty-one years.

Everything for the Home, the Farm and the Family

FOR WOMEN: Montgomery Ward's first catalogue contained mostly things for women. So for 51 years our best efforts have been given to the woman's and young woman's needs and wishes. And so in New York our own Fashion Experts live and work to buy the best New York styles for you. You can get at Ward's the best and newest styles in garments with the utmost wearing quality without paying the usual Fashion profits.

FOR THE HOME: All over America thousands of homes have been made beautiful, comfortable and convenient by articles bought from Ward's. Our experts are practical artists in home furnishing. Here in this catalogue you will find everything new for the home, everything beautiful, and at a saving that will enable you to do even more than you expected in beautifying your home.

FOR THE FARM: We know the farmer's needs. We have studied them for over half a century. And so we can say to everyone on the farm that at Ward's everything for the farm is intelligently chosen with practical knowledge of its use. Fencing, hardware, roofing, tillage tools, tires and everything for the automobile—of reliable quality is offered at a big saving.

FOR MEN: Suits, overcoats, shoes, everything the man, young man or boy wears can be bought at Ward's not only at a saving, but with assurance of satisfactory service in everything you buy.

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Our records prove that during the past year most of our orders were shipped in 24 hours—nearly all of our orders within 48 hours.

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XUM

TREE TANGLEFOOT

An Absolute Protection for Fruit Trees, Shade Trees and Vineyards against Climbing Insect Pests

No climbing or creeping leaf-eating insect can cross a band of Tree Tanglefoot . . . a harmless sticky material applied in narrow bands to the trunks of shade, fruit and nut trees and grapevines.

One application remains effective three to four months, *outlasting 10 to 20 times any other known substance.*

Tree Tanglefoot has practically displaced all other tree-banding compounds wherever introduced.

A pound makes 12 lineal feet of band three inches wide. No expensive apparatus or skilled workmen are required . . . easily and quickly applied with a wooden paddle.

Especially recommended against:

Climbing Cutworms Canker-worms
Tussock Caterpillars Ants
Gypsy and Brown-tail Caterpillars

For tree surgery: Tree Tanglefoot is superior to anything on the market. It will absolutely waterproof crotches of trees, wounds and cavities, when nothing else will.

Endorsed by America's leading horticulturists.

Sold by nearly all seed houses and many hardware and drug stores.

PRICES:
1-lb. cans 60c each
5-lb. cans $2.75 each
10-lb. cans $5.25 each
25-lb. pails $11.00 each

Send for free illustrated booklet on leaf-eating insects.

THE O. & W. THUM COMPANY, GRAND RAPIDS, MICHIGAN

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HOUSEHOLD INSECTICIDES
FLY PAPER - FLY SPRAY - FLY RIBBON - ROACH & ANT POWDER - TREE TANGLEFOOT

DOW SPRAY MATERIAL
"GETS 'EM"

More than one hundred chemists unite in preparing DOW products in accordance with the best scientific knowledge. DOW owned test orchards and the co-operation of experiment stations assure correct manufacture. Thus DOW Powdered Lime Sulphur comes to you as an effective weapon with which to fight the enemies of the orchardist. This preparation is uniform and without lumps—cannot clog pumps and like all DOW.

INSECTICIDES & FUNGICIDES

Saves you excessive freight charges as you do not have to pay for the liquid which you can add just as effectively at home.

DOW Powdered Lime Sulphur—as effective as solution—easier to handle and store. No danger of freezing.

DOW Powdered Lead Arsenate—The standard poisonous spray for killing external leaf-eating and chewing insects, bugs, worms, etc.

DOWCO—a double-purpose combined insecticide and fungicide where one spray is used for both bugs and blights.

BORDOW—a copper fungicide ready to use in control of various blights and fungus.

Insist upon "DOW" sprays if you want sure results.

Easily mixed—adhere tenaciously—extremely economical.

DOW service is prompt!

Write for Free Spray Calendar.

THE DOW CHEMICAL COMPANY
MIDLAND, MICH., U. S. A.

Frost Protection for California Citrus Orchards

(*Continued from page* 10.)

Weather Bureau, gives much valuable information along this line. From the study of the principles laid down in Mr. Young's Bulletin and a careful watch of what actually takes place on cold nights, the grower will soon learn to predict the rate of fall and, to some extent, the expected degree of cold. In the southern California fruit growing districts, the United States Weather Bureau maintains a fruit frost service and any night during the winter season the expected minimum temperature is available to the growers by 7:00 p. m. This forecast is so accurately made that it is seldom more than a degree in error. The Service is supplemented by the records of growers who keep daily minimum temperature records from properly sheltered thermometers. These records may be compared with those of the Key station of the Weather Bureau from which the forecast is made so that the grower may know just what to expect on his own place after getting the government forecast.

Floyd Young, United States Weather Bureau, showing simple thermometer shelter for orchard use. Photo courtesy of Agricultural Extension Service, Los Angeles County.

The danger point for oranges is 27 degrees and for lemons about 28 degrees. If these temperatures are reached before morning, firing should be started. If the weather conditions are such that the temperature is dropping very slowly, the lighting of a few heaters, perhaps alternate heaters in alternate rows, will be satisfactory. If the low temperature occurs early in the night and the drop is rapid, more heaters will have to be lighted. The proper system is to light one-fourth to one-half of the heaters distributed throughout the orchards. These can be lighted by one or two men with torches who remove the covers, open the drafts up wide and do the firing. Other men come along after the heaters are hot and regulate the drafts.

The men in charge of the heating should watch the thermometers in the orchard as well as outside and regulate the heat accordingly. Much oil is wasted in some orchards because of the failure to watch the outside thermometer which may have risen above the danger point because of a breeze that had arisen. If the thermometers go above the danger point, the heaters can be put out.

Many of our freezes last three or four nights and the writer has known of orchards being fired eight nights in succession. It is absolutely necessary that the heaters be refilled during the day following their use that they may be ready before the next night, and, if they are of the type difficult to light, it is a good plan to put in new wicking. The longer the heaters have been burned the easier they are to light, as the soot catches some of the torch fuel and holds the heat in one place until the heaters get under way.

Many growers have not fully decided that it pays to heat and this, of course, must be determined by the past history of the orchard. The writer believes that if a major freeze occurs only once in 10 or 11 years, it still pays to heat. The manager of one of the large ranch companies stated that during the last five years the yield in one of their orchards has increased five and one-half times, the only change in cultural practice being the heating of the orchard. It has been necessary to heat four out of the five years. There are many cases where isolated orchards have been very successfully protected even with the temperature outside the orchard running as low as 16. The grower is usually amply rewarded for his work and expense by the fruit which he saves. In addition to this, there has been a great gain because the trees are in better condition to bear for the succeeding years.

Cost of Heating an Orchard.

The following table summarizes the expenses of a grower heating an isolated orchard in the cold district for four nights during the freeze of 1922. The annual expense, including a depreciation on the equipment, will run from $30 to $40 per acre, depending upon the number of nights of firing. The overhead is about $27 per acre per year if no firing is done. To this must be added the cost of oil and labor.

Cost and Results, Heating 10 Acres of Oranges, 1922.

Heating 4 nights. Lowest temperature outside 17 degrees. Temperature inside orchard 24-30 degrees.

Oil burned—1,200 gallons at 4 cents	$ 480.00
Outside help—two men firing and filling	55.00
	$ 535.00
Fruit saved—3,100 boxes first year.	$6,900.00
Increase in crop next two years because of heating	2,000.00
Total of fruit saved	$8,900.00
Cost of heating	$ 535.00
If one freeze in 10 years. Depreciation for 10-year period	1,746.00
Care of heaters	500.00
Interest	523.00
Total cost	$3,304.00
Profit from heating if only one freeze in ten years	$5,596.00

Anything short of full preparedness and an intelligent use of the equipment at hand means a needless waste of money, but to those who are fully equipped and who are ever vigilant throughout the danger season, the returns are such as to handsomely repay them for their labor and trouble.

Inside Story of the Apple

(*Continued from page* 5.)

flower parts than spurs about it not defoliated.

Finally, in a tree which is bearing a fair crop of fruit so that there is neither a great excess nor a deficiency of carbohydrates, the buds adjacent to the largest leaf area would be most likely to form buds. Hence those spurs which make a good vegetative growth and which thus carry a large leaf surface are most likely to produce fruit buds.

The factors which have a bearing on fruit bud formation are many and complex. In this article we have endeavored to point out the nutritive ratio or ratio of carbohydrates to nitrogen which is associated with fruit bud formation. We have also indicated the probable part played by the tree as a whole and the part played by the individual spurs with their attached leaf areas in fruit bud formation. Next month we will deal particularly with the influence of the crop upon the tree on fruit bud formation and with the subject of alternate bearing in apples.

ATHENS, Tex., reports the receipt of a load of watermelons on December 29. The growers had no trouble in disposing of them at a fancy price. They were planted on July 28 and grew on branch bottom, sandy loam soil without irrigation.

Biggest Money's Worth!

Folks who know automobiles from A to Z, and know by heart all the features of many cars, are saying some mighty fine things about the new Overland Champion. They are calling it the most useful car on wheels—and the most automobile in the world for the money!

The Champion fits right in with the work around the farm, besides giving the whole family all the pleasures of a closed car. Rear seat and upholstery come out entirely—giving you 50 cubic feet of square space for carrying anything you want to haul.

Wide doors both front and rear. Adjustable seats for tall and short people. Seats make into a full-size bed in car for camping. Washable Spanish grain upholstery. *Patented* Triplex Springs. The bigger Overland engine. Extreme economy. Reliability. Everything to make owners glad they own a Champion.

WILLYS-OVERLAND, Inc., TOLEDO, OHIO
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Overland CHAMPION

All the benefits of a closed car with the extra advantage of greater usefulness.

No hotel bills on long trips. Seats make into a full-size bed in the car for camping.

Both seats adjust backward and forward to accommodate tall and short people.

XUM

the doctor
I think the Fisk Red-Top is the only tire on the market for country use
Time to Re-tire? (Buy Fisk)
FISK
RED-TOP
CLINCHER TIRE

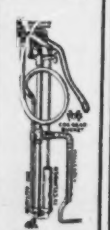
Free
TELLS YOU HOW and WHEN TO SPRAY FRUIT AND VEGETABLES

Send for it to-day! tells you why you can't go wrong with
MYERS SPRAY PUMPS

ILLUSTRATED CATALOG

MYERS PNEUMATIC COMPRESSED AIR SPRAYER

No. 296

COG GEAR BUCKET SPRAY PUMP

No. R 324

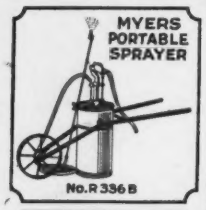
COG GEAR BARREL SPRAY PUMP

No. R 318 B

GETTING anxious to spray. Orchardists, gardeners, farmers and others who have trees, plants or vegetables to spray are thinking and talking about it every day, and are waiting for favorable weather to begin operations. To those who contemplate purchasing a new spray pump, spray rig, nozzles and accessories, MYERS HAND and POWER SPRAY PUMPS offer a logical solution to your spraying problems. Pioneers in the field with fifty years of pump building experience behind them, designed and built by experts, endowed with many patented improvements and exclusive features, sizes and styles for every requirement, they afford a standard of spraying service unequalled for high efficiency, economy and dependability.

Myers Bucket and Barrel Spray Pumps have easy operating cog gear head, patented agitators, brass ball valves, best of hose and nozzles, are large of capacity and throw a powerful penetrating spray. MYERS POWER SPRAY PUMPS and complete POWER SPRAY RIGS are automatically controlled, self-lubricated, have covered working parts and other radical improvements in design and construction which permit of operation under heavy pressure with perfect safety, insure a full uniform discharge, reduce wear and breakage to a minimum, and add years of life to the equipment. Different styles and sizes meet capacity needs.

Before you purchase, write us for a copy of our SP24 Catalog. It will tell you all about Myers Spray Pumps, and give you instructions as to how and when to spray. Your dealer can supply you, or we will be glad to tell you where you can quickly obtain them. Catalog is free without the least obligation.

MYERS PORTABLE SPRAYER

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MYERS COG GEAR DOUBLE ACTING COMPLETE SPRAY OUTFIT

MYERS LOW DOWN AUTOMATIC POWER SPRAY RIG COMPLETE EXCEPT ENGINE

No. 80

THE F.E. MYERS & BRO. CO. No. 150 Orange St. ASHLAND – OHIO
Manufacturers for over Fifty Years of MYERS HONOR-BILT PUMPS FOR EVERY PURPOSE
WATER SYSTEMS FOR HOME FARM AND FACTORY
·HAY AND GRAIN UNLOADING TOOLS·
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Interesting Booklets on Request

Code of Fruit Nomenclature—American Pomological Society

ADOPTED November 8, 1923, at the New York meeting of the Society.

This code aims to establish a simple and clear system of pomological nomenclature that shall be appropriate and stable. Accordingly it is urged that all persons naming new varieties of fruits choose simple, one-word names that are fittingly expressive of some character, quality, place, person, or event associated with the source, time or place or origin of the variety.

The paramount right of the originator, discoverer, or introducer of a new variety to name it, within the limitations of this code, is recognized and established.

The term "kind" as herein used shall be understood to apply to those general classes of fruits which are grouped together in common usage without regard to their exact botanical relationship, as apple, cherry, grape, peach, plum, raspberry, etc.

I. Form of Names.

1. Names of new varieties shall be of one word preferably, but two words may be accepted. Names of existing varieties shall not be changed in such way as to lead to confusion or loss of identity.

2. The spelling and pronunciation of a variety name shall be the same as that of the person, place, substance, circumstance, or quality from which it is derived.

3. A possessive noun shall not be used.

4. Initials should not be used as a part of a variety name.

5. A name shall not be formed by the compounding or hyphenating of two or more existing names, but this does not prohibit the formation of a one-word name by the use of parts of two or more existing names. The hyphen shall not be used between the words of a name. Thus, neither Bartlett-Seckel nor Bar-Seck may be used, but Barseck is admissible.

6. Such general terms as seedling, hybrid, beurre, damson, pippin, rareripe, bigarreau, should not be used.

7. A variety imported from a foreign country should retain its foreign name, subject only to such modification as is necessary to conform it to this code, and provided that names having a recognized English equivalent may be, but are not necessarily, so rendered.

8. The name of a person shall not be applied to a variety in his lifetime without his consent.

9. The name of a deceased person shall not be applied to a variety except through formal action by some competent pomological body, preferably that with which the deceased was most closely associated.

II. Priority, Usage and Duplication.

10. The name first published for a variety shall be the accepted and recognized name except when contrary to the provisions of this code; but names established by usage in American pomological literature may be retained even though they do not conform to these rules.

11. A name once used shall not be used again for a variety of the same kind, except that a name once established through long usage for two or more American varieties shall not be displaced for either or radically modified unless a well-known synonym can be used in its place; or when no such synonym is available, the varieties bearing identical names may be distinguished by the addition of the name of the author who first described each, or by some other suitable distinguishing term.

III. Publication, Description and Citation.

12. Publication consists in: (1) The public distribution of a printed name and description or characterization of the fruit; (2) the publication of a new name for a variety described

(Concluded on page 19.)

Fordson

A new year dawns on the farm with the coming of spring work.

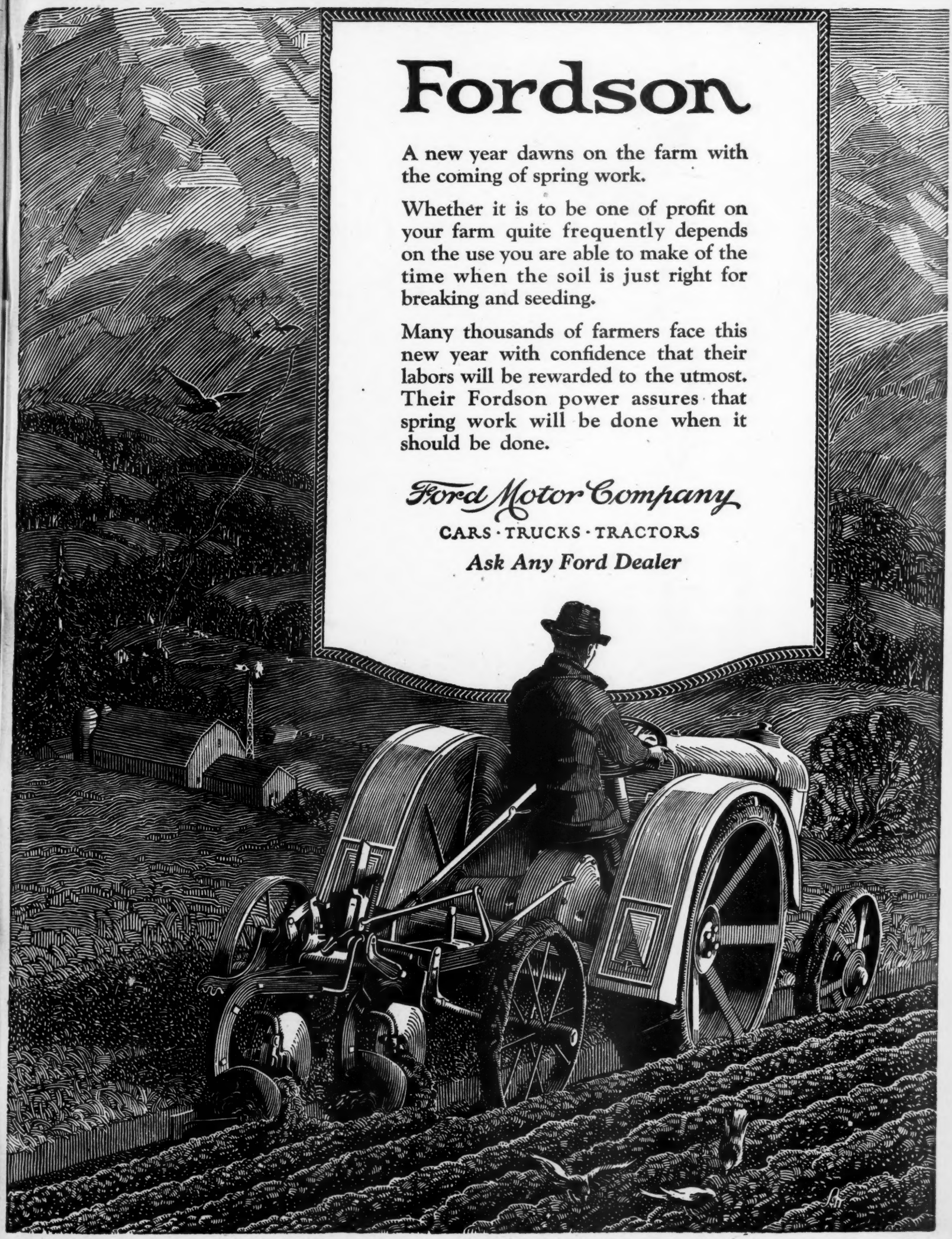
Whether it is to be one of profit on your farm quite frequently depends on the use you are able to make of the time when the soil is just right for breaking and seeding.

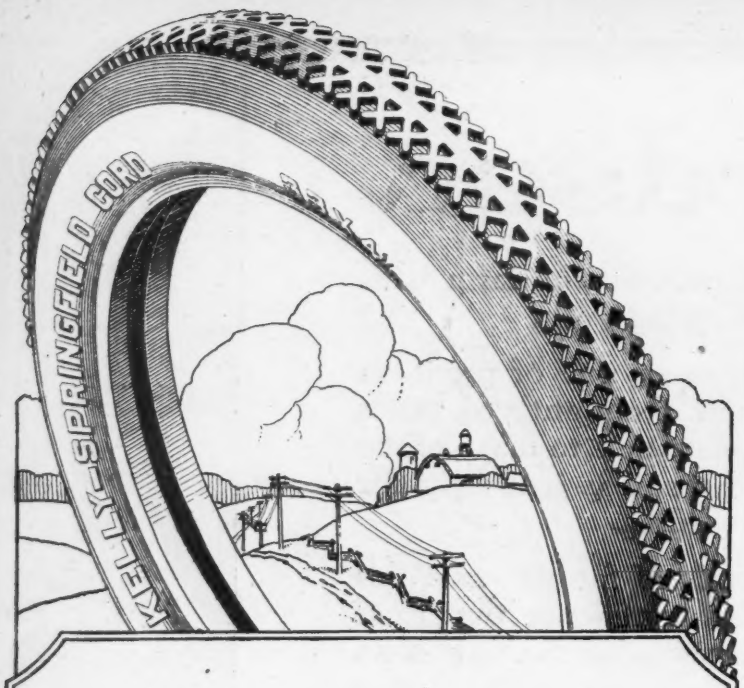
Many thousands of farmers face this new year with confidence that their labors will be rewarded to the utmost. Their Fordson power assures that spring work will be done when it should be done.

Ford Motor Company

CARS · TRUCKS · TRACTORS

Ask Any Ford Dealer





The man who buys the best is never sorry

When you buy a cream separator, a plow, a reaper, a binder or any other piece of farm machinery, you insist, if you are wise, on one particular make because you know that that make, whatever it may be, is the very best in its line.

Inferior farm equipment does not pay and neither do "cheap" tires. In tires as in everything else, it pays to buy the best.

For over a quarter of a century Kelly-Springfield tires have had an enviable reputation for high quality. Until quite recently they sold at considerably higher prices than other tires, but now greatly increased production has brought the prices down. Now—

It costs no more to buy a Kelly

KELLY SPRINGFIELD TIRES

The Art of Grafting

(*Continued from page 3.*)

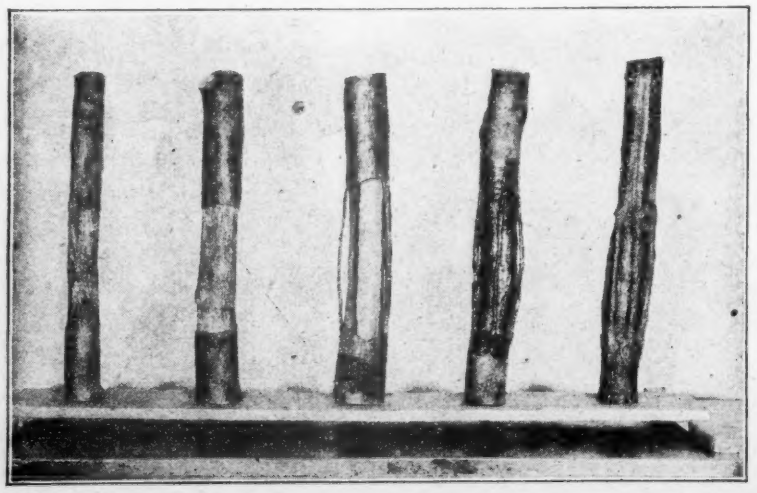
stock. To insure this contact of the cambium layers the scions are placed slightly at an angle so that the cambium layer must necessarily cross that of the stock at one point. The whole end of the cut branch, including the tips of the scions, and the whole length of the split in the large limb is covered thoroughly with grafting wax. If both scions grow, they should be allowed to remain for one or two years until the end of the cut branch has become covered with a new growth. After that time the weaker one of the scions should be cut away to prevent a narrow forked crotch from forming. In topworking large trees by this method, only a part of the tree should be worked the first year and the job completed the second year. In this way it is not necessary to remove the entire top of a large tree at one time.

The Whip Graft. This graft is used for work on small branches where the cleft graft would not be convenient. It is better illustrated than described. The stock is cut off just above a smooth place free from knots. A smooth beveled cut about an inch and a half long is made on the end of the stock. This may extend clear across the stock if the branch is small, or on a slightly larger branch, a half inch in diameter or more, it is better to make the cut along one side and not reaching to the pith. Beginning about one-third of the distance down from the top of this beveled cut, a thin tongue should be cut about one-third of the length of the original bevel. To secure a good fit, this tongue should be cut and not split. The scion is now similarly prepared, making a beveled cut the same length as that in the stock with the top of the bevel opposite a vigorous bud. After the tongue has been cut in the scion, the two pieces are fitted firmly together, care being taken that the inner bark is in contact along one side. The whole union is then wrapped firmly with cotton twine and covered with grafting wax. After the scions have started to grow, the string which binds the parts together should be cut to prevent girdling.

This graft is used extensively in growing nursery trees where short pieces of apple root are grafted to scions about six or seven inches long. These root grafts may be made up during the winter, tied into bundles and packed away in damp sand or sawdust in a cool cellar until spring, when they are planted in nursery rows with just the tip bud of the scion projecting from the ground. In making a root graft, it is not necessary to wax the union, but they are usually tied together with a waxed string, prepared by dipping a ball of No. 18 cotton string into melted grafting wax. In addition to its use in growing nursery stock, the whip graft is also used in topworking young trees.

The Side Graft. For topworking small trees or grafting any small branch, the writer prefers the side graft to the whip graft before mentioned, although it is not used as extensively as is the whip graft. In making this side graft, the scion is prepared in much the same way as for cleft grafting except that the wedge-shaped point is somewhat shorter. The limb into which it is inserted receives a diagonal cut reaching nearly to the pith. This cut is then opened slightly by bending the limb and the wedge-shaped scion is squeezed firmly into place, care being taken that the bark of the two come into contact along one side. With the scion in place, the end of the branch is released and it will be found that the natural spring of the stock will hold the scion so firmly that it is difficult to pull it out. The original branch is then cut off just above the point where the scion is inserted and the whole union covered with wax. No tying is necessary. Nurserymen use this form for crown grafting, that is, the placing of a graft in a small seedling tree near the ground.

Bridge Grafting. The bridge graft is used almost entirely for repairing injured trees and is not used for propagation. It is a common occurrence to go to the orchard after the snow has gone in the spring and find trees badly girdled around the base by mice or other rodents. These trees will, of course, die if left alone and yet may be saved by a very simple treatment. The bridge graft is recommended for such conditions and is merely the bridging over of the wound by means of scions which are inserted both at the top and bottom of the injured part. The first thing to be done is to cut away the frayed and rough edges of the bark, both at the top and the bottom of the girdle and to clean up the whole wound to facilitate subsequent healing. At opposite points on the top and bottom of the girdled place, a slit should be cut lengthwise in the bark and the edges of the bark loosened at these slits. Strong, vigorous scions are then selected long enough to reach across the injured place. They are measured to get the right length and are prepared with a smooth beveled cut at each end, care being taken to have the cuts on the same side of the scion. The base of the scion is then inserted in the lower slit with the beveled cut next to the wood. It is shoved down into this slit until the entire length of the bevel is concealed beneath the bark. With one hand holding the base of the scion in position, the other hand may be used in bending the scion until the upper end may be inserted under the bark at the upper slit. When both beveled ends of the scion have been inserted, the scion itself should be straight and lie fairly close to the main trunk of the tree. The ends of the scions should be nailed in place with small brads or cigar box nails. More scions should then be inserted at intervals of about an inch and a



Repairing a girdled tree by means of the Bridge Graft. Tree at right shows scions after one year's growth.

half until the tree has been surrounded. They should be carefully waxed at both top and bottom and it would do no harm to cover the bare wood of the girdled trunk with wax also to prevent its cracking. If most of these scions unite, the life of the tree will be maintained and it will

Grafting tools—grafting knife, cleft grafting chisel and mallet to use with chisel.

make a normal growth during the succeeding summer. In a few years the scions will so increase in size that they will unite and form a shell of living wood around the tree.

In the case of collar rot or other disease destroying the bark at the base of the tree, it is sometimes necessary to dig away the soil and insert the lower end of the scion into the bark of some of the larger roots. In extreme cases it has been found possible to save trees thus injured by planting several small straight nursery trees around the larger tree and grafting the tops of them into the trunk of the main tree above the affected bark.

PROF. W. H. ALDERMAN, chief of the division of horticulture, University of Minnesota, was elected president of the Minnesota State Horticultural Society at its fifty-seventh annual meeting recently held in Minneapolis. Charles Haralson of Excelsior was elected to the executive board and D. C. Webster of La Crescent and O. J. Olson of St. Paul were continued on the board for another term. Reorganizing for the year, the board re-elected R. S. Mackintosh of University Farm, St. Paul, secretary-treasurer. All the sessions of the annual meeting were largely attended. The fruit display was larger and better than usual. Vegetables of all sorts and some flowers were exhibited.

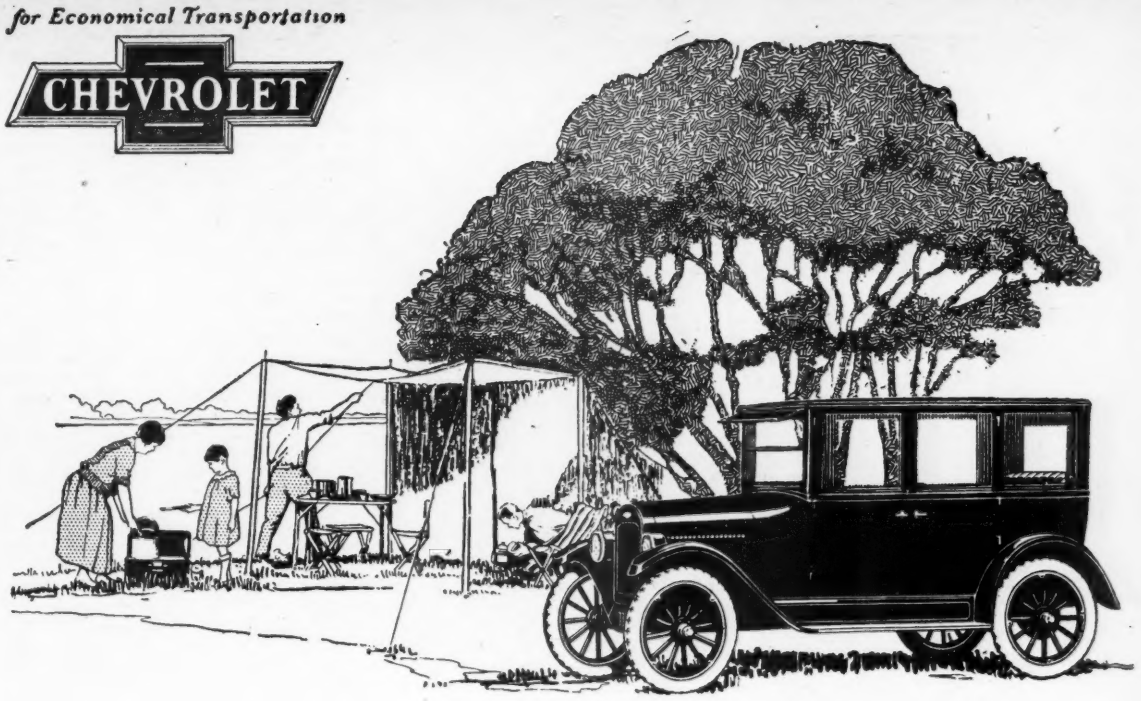
Among speakers from other states at the meeting were Prof. N. E. Hansen of the South Dakota Agricultural College; W. A. Toole, delegate from the Wisconsin society; Prof. A. F. Yeager of the North Dakota Agricultural College; and Moulton B. Goff of Sturgeon Bay, Wis. The social feature was the annual banquet at the Elk's club.

The Minnesota State Horticultural Society has a membership roll of more than 3000, exclusive of 500 or 600 honorary members. Secretary Mackintosh says a campaign for more new blood will be kept up the coming year. He anticipates a total membership of 4000, not including the honoraries, by the end of 1924.

We are indebted to the California Almond Growers' Exchange for the cuts used on the front cover of this issue.

for Economical Transportation

CHEVROLET



Will Your Family Be Happy Next Spring?

A low-priced, modern automobile like the Chevrolet has become indispensable to the American family of ordinary income. Without it they are prisoners on limited range—like hobbled horses in a pasture.

The inspiring beauties of Nature, the interesting and educational features of other places and other types of people and ways of living remain things to be read about, or seen dimly in cold photographs, until you are free to GO TO THEM at your convenience and pleasure.

Suppose you have definitely decided to buy a Chevrolet next Spring.

That does not necessarily mean you are going to get it.

Anyone posted on conditions in the automobile business will tell you that thousands of families are going to be unable to get cars next Spring. That has been true almost every Spring for the last ten years, but the shortage in April, May and June, this year, is going to be more serious than ever before.

There are just two ways of making sure of getting your Chevrolet for use when the flowers and balmy breezes of Spring lure you to the country roads:

Buy it NOW, or order it NOW.

If you do not want to pay for it in full at this time, any Chevrolet dealer will arrange terms to suit your convenience, so you can *pay as you ride.*

You will be surprised to learn how easy it is to pay for a Chevrolet and to get possession and use of it.

The only way to be sure of a Chevrolet next Spring is to order it NOW.

Chevrolet Motor Company, Detroit, Michigan

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Superior Roadster	$490	Superior Commercial Chassis	$395
Superior Touring	495	Superior Light Delivery	495
Superior Utility Coupe	640	Utility Express Truck Chassis	550
Superior 4-Pass. Coupe	725		
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Fisher Bodies on all closed models

Five United States manufacturing plants, seven assembly plants and two Canadian plants give Chevrolet the largest production capacity in the world for high-grade cars and make possible our low prices. Dealers and Service Stations everywhere. Applications will be considered from high grade dealers only, for territory not adequately covered.

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The Biggest Thing in Spraying

Hayes Pump & Planter Co.
Dept. 13, Galva, Ill.

Please send me folder and full details. I have ....trees, aged....years.
Variety.....
Name.....
Address.....
Town.....
(Use margin if necessary)

Let us tell you how Hayes "Fruit-Fog" Sprayers kill that 47% of diseases and pests that drenching with low pressure sprayers cannot touch. The 300 lbs. guaranteed pressure, combines with the scientifically constructed Hayes nozzles to give an atomized super-spray which surrounds and penetrates into the smallest niches and crevices. You get larger, finer fruit—and more of it—when you spray with a Hayes "Fruit-Fog" Sprayer.

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You can now suit your ideas of price and get the famous Hayes "Fruit-Fog" Sprayers in sizes 3½ to 16 gal. per minute capacity, with or without trucks, engines, or equipment. The smallest Hayes Sprayers have the same high pressure, long life, and corrosion proof pumps as the largest.

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Distributors and Dealers in all principal cities.

HAYES PUMP & PLANTER COMPANY
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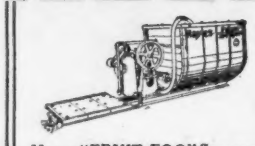
Full line of Power Sprayers, Traction Sprayers and Hand Sprayers.



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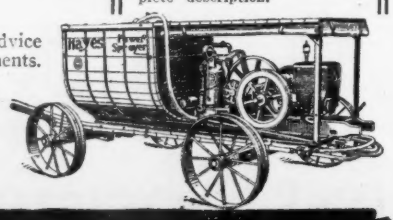
You can get any size Hayes "Fruit-Fog" Sprayer without equipment if you wish—and get "Fruit-Fog" results at minimum cost. What you lack we will furnish at rock bottom prices consistent with Hayes quality.

Hayes 1903 (Below)—A 150-gallon sprayer which has made a nation-wide reputation. Send for folder, which gives complete description.



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Aphis-stung apples

Don't let this happen to *your* apples

Kill the aphids before they have a chance to do serious damage to fruit or trees. Spray with Hall's Nicotine Sulphate. It contains 40% pure Nicotine—the deadliest aphis-poison known.

Being a vegetable extract, it does not harm blossom, fruit or foliage; but it does kill aphids every time.

A ten-pound tin makes 800 to 1100 gallons of spray. The cost is less than *2c a gallon.*

When spraying for scab, codling moth, etc., mix Hall's Nicotine Sulphate with the solution and make one spray do double duty.

Buy from your dealer. If he cannot supply you, send us your order along with his name.

Note—Hall's Nicotine Sulphate is also deadly effective against thrips, red bugs, leaf hoppers, psylla and many similar insects on fruit trees and truck crops.

10 lb. tins, $13.50
2 lb. tins, 3.50
½ lb. tins, 1.25
1 oz. bottles, .35

HALL'S
NICOTINE SULPHATE

Hall Tobacco Chemical Co.
212 Fifth Avenue, New York City

Progress of Variety Certification

by J. K. Shaw

Massachusetts Agricultural College

FOR THE past three years the Massachusetts Fruit Growers' Ass'n has offered, for the benefit of nurserymen and fruit growers, to examine nursery apple trees for trueness to name and to certify such as passed the test as true to name. This has been done in an effort to solve a problem tha' has given fruit growers a lot of trouble ever since the industry has been established, and one that has hitherto been unsolved. For the first two years this offer was made to Massachusetts nurserymen and dealers only, but in 1923 the offer was extended in a limited way to nurserymen anywhere in the country. This offer was given only limited publicity, but about 56,000 trees were certified outside the state the past season.

The certification plan rests on identifying varieties in the nursery row. It is not our purpose here to discuss the possibility of doing this successfully. Every fruit grower knows a few varieties by the trees, and most experienced fruit nurserymen know a good many. It may not be possible to carry on this work on a large scale without occasional mistakes, but there is no question that misnamed trees may be detected by competent observers with very few errors. The writer has frequently said: "It is as easy to know varieties from the nursery trees as from the fruit if one will study them as much."

The Massachusetts Fruit Growers' Ass'n has undertaken certification work outside of Massachusetts with the expectation that it will be only temporary. Probably there are grown in Massachusetts less than 10,000 nursery apple trees annually. It was therefore necessary to go outside the state to find trees enough to test out the plan to see if it was practicable. The work the past year was extensive enough to give some indication of whether fruit growers think it worth while, and probably the next year or two will show whether the plan is to be used more or less extensively or discarded as not worth while.

How the Certification Plan Works.

At this point it may be well to explain briefly how the certification plan works. Any nurseryman may apply to the secretary of the Massachusetts Fruit Growers' Ass'n for certification. The association then sends an expert to examine the trees and to those found true to name a lead seal is attached by drilling a one-sixteenth inch hole through a branch of each and every tree. A hand seal press then stamps the name of the variety on the seal which cannot become detached from the tree, or if removed cannot be replaced. Any subsequent mixing of varieties in the packing shed or elsewhere is absolutely prevented. The actual cost of the work is borne by the nurserymen. It has in the past amounted to about two cents per tree, more in small lots and somewhat less where large quantities were handled. This includes the total expense of the work. This extra cost of two cents per tree does not, of course, represent what the nurseryman should charge extra for certified trees. He must necessarily get more than that as some certified trees will for various reasons not be sold and he is entitled to a profit on the venture. The Massachusetts Fruit Growers' Ass'n realizes no profit for its sponsorship of the scheme. It has not seemed advisable to attempt to exercise any control over the selling price of certified trees, leaving it to the operation of the law of supply and demand.

The work thus far has been with apple trees only, but with a wider knowledge other fruits might be handled with at least some degree of success. It has been going on three years with results as follows:

Year.	No. trees examined.	No. certified.	No. refused certification.
1921	2,847	2,580	267
1922	8,875	8,437	438
1923	66,815	65,910	905

No nursery examined for the first time has been found free from misnamed trees, but the proportion has varied from less than one per cent to more than 10 per cent. Once the misnamed trees are eliminated from a given nursery, it remains practically straight, yet stray trees appear in small numbers. For example, in examining a block of over 3,000 Baldwins, all were true until in the last row four McIntosh trees were encountered. If it so happened that buds were cut from these four trees the Baldwin block propagated from this block and arriving at the age of two years in the fall of 1925 would contain 50 or 100 McIntosh. Thus trouble may begin and grow. Occasionally an entire row carried under a certain name is really something entirely different, as in the case of an unknown variety with roundish leaves that has been grown in more than one nursery under the impression that they were Gravenstein. Many New England fruit growers have found to their sorrow that they do not bear Gravenstein apples.

One should not get the impression that there is any large proportion of misnamed trees growing in nurseries, but there are almost always a few. It is practically impossible to prevent occasional errors and the only way to keep varieties correct is by frequent examination of the nursery rows and the elimination of misnamed trees.

There is no logical reason why a state fruit growers' organization should operate over the whole country other than that no other organization has appeared to do the work. Presumably this extensive work of the Massachusetts organization is only temporary and if the certification work becomes more extensive it will be supervised by some other organization. Whether it will be through one organization covering the whole country or whether through one in each of the states where nursery interests are rather extensive remains to be seen.

The Massachusetts Fruit Growers' Ass'n is prepared to keep on with the work until its value is determined and has a tentative plan by which a million or more trees might be handled in 1924, though it is regarded as unlikely that there will be a demand for that much work.

One of the problems connected with certification work is the development of experts competent to tell if varieties are really what the nurseryman says they are. The work must be done during the summer and early fall. This coincides fairly well with the summer vacation periods of agricultural colleges, and it is this source that offers the best promise of trained men. One competent man should be able to examine several hundred thousand trees during this period, while the actual work of attaching the seals to approved trees may be supervised by less skilled men who are in training for more expert work later. The writer has no means of knowing how many competent men may be available but there may be very few. But men who have already had a good college training, with plenty of work in systematic botany, can probably be trained for this work as fast as the demand arises.

Whatever the future of the variety certification plan, it ought to stand or fall on its own merits and its real value to the nurseryman and fruit grower. It ought not to be for the present, at least, a matter of legislation. If it is not worth while it will fail to develop to a real factor in the nursery business, if it is worth while it will grow and spread as its value warrants.

EMBROIDERED pillowslips, when the centers begin to break, make dainty petticoats for small daughter. One pair, with embroidered scallops will make two pretty skirts to wear with best dresses.

Code of Fruit Nomenclature

(*Continued from page* 14.)

elsewhere under a different name, number, or other untenable designation, the synonym being given.

13. Publication of a name may be made in any book, bulletin, report, trade catalog or periodical of public distribution and bearing date of issue.

14. But a varietal name may be established by current usage in the locality of its origin, when well-known, and shall be considered as published and have precedence over a later printed name for the same variety.

15. Complete description of a variety consists of a detailed account of the characteristics of the plant, foliage, flowers, fruit, and habit of growth, so as to distinguish it from other varieties of similar appearance.

16. The type of a variety is the fruit of the original plant; and type descriptions or illustrations shall be made from material produced by the original plant, or when this is not available, from a plant as near as possible to the original in a sexual reproduction, and preferably grown in the same pomological region.

17. The full citation of a variety name consists of the name of the author who first described the variety, and the name, page, and date of the publication in which the description first appeared. An author-citation following a name refers to the author of the original description of a variety: e. g., Turley, C. P. C. Names of authors and published works may be abbreviated, in accordance with the usages of this Society.

Weeds in the Orchard

by Agnes Hilco

I HAD an uncle with some very queer notions about weeds in his orchard. He left them to grow unmolested until apple picking time and then he mowed paths from tree to tree. Of course his apples were not such fruit as you expect to buy on fruit stands—he was growing more weed seeds than fruit. Now he thought that these weeds would rot and keep the orchard rich, but he never figured how much plant food there was left for the trees when they were growing. Plant food becomes available slowly in the spring and if the trees have the chance to make use of all of it they are not getting as much as they could use to advantage, and when the weeds use such an amount as they require the trees must suffer.

In summer plant food is made available much faster, and becomes too abundant and the weeds would not harm the trees, except as they make a harbor for insects, but this is not the case in the spring when the fruit is forming. Even when the orchard is not cultivated, weeds and grass should be kept cut or a light growing grass should be used to make them draw as little from the soil as possible.

A cover crop can be sown in July that will be of far more value than the weeds if the orchard is cultivated. A friend of mine raises potatoes or some other crop in his orchard every year and seeds the ground to buckwheat afterward, and in winter hauls out a covering of manure, and his soil has been getting better right along, and it is very much improved in mechanical texture. He got 150 bushels of potatoes off the acre orchard and about a third as much space in addition last year and the rows were not within five feet of the tree rows, and the county agent and extension man from the college pronounced it as standing first in the demonstration orchards of the county.

IT IS a nuisance to remove elastics from garments now, because they are joined by sewing. Why not sew snaps on the ends of the elastics in skirts, petticoats, etc., and then just unsnap them when they are to come out? Then you won't have the trouble of sewing the ends when they are put back in, either.

Danger!

Don't — *don't* leave your helpless orchard at the mercy of those *bandits* — Peach Leaf Curl, Twig Borer, Blister Mite, San Jose Scale, Apple Powdery Mildew, Apple and Pear Scab, etc. — BANDIT is too mild a word for them.

What to do? What to do?

Spray your trees with

SHERWIN-WILLIAMS Dry Lime-Sulfur

and save your fruit crop

Read This:

What *is* this world-beating Insecticide and Fungicide?

Answer: It is standard 33° Baume Lime-Sulfur, but in *dry powdered form*.

It it an experiment?

Answer: By no means. Proven by expert authorities for the last 8 years (Get the book). Millions of pounds sold.

Can it freeze, or crystallize, or leak and smell up the premises, like Liquid Lime-Sulfur?

Answer: It can not.

Can it gum up the spraying nozzles?

Answer: No — positively fine and soluble.

Does it deteriorate in storage?

Answer: No — not in any season or climate (Get the book).

Does its effect last?

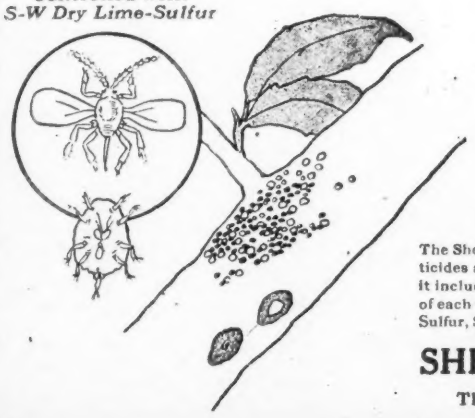
Answer: Remarkably — contains a stabilizer which prolongs its action.

Is it easy to handle?

Answer: Very easy — light, no heavy hauling or handling.

San-Jose Scale

Controlled with S-W Dry Lime-Sulfur



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Get the Book

Write us for a copy of the remarkable book entitled "The Truth About Sherwin-Williams Dry Lime-Sulfur." It is an eye-opener. It is invaluable. It is free. Write *now* — don't miss this book.

The Sherwin-Williams line of Insecticides and Fungicides is complete — it includes the foremost preparations of each type, such as S-W Dry Lime-Sulfur, S-W Dry Powdered Arsenate of Lead, S-W Paris Green, S-W Arsenate of Calcium, S-W Fungi-Bordo, S-W Spra-Mulsion (Miscible Oil) etc. There is a Sherwin-Williams spray for every purpose. Send for folders on any product.

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Get This FREE Book

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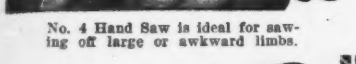
Do your pruning with Atkins Saws and you'll save time, labor and money—and get better results. These saws are made of the famous "Silver Steel"—the finest saw steel in the world. They cut faster and cleaner, run easier, and stay sharp longer with less filing than any other saws. Our Duplex Pruner, shown above, has two edges—one for fine cutting, other for heavier work. A very popular saw.

No matter what your saw needs may be, it will pay you to use Atkins Saws. They are made in styles for every purpose. If your hardware dealer does not have the ones you want, send us his name and you'll get them promptly. Insist on Atkins Saws.



No. 4 Hand Saw is ideal for sawing off large or awkward limbs.

No. 7 Tapered Saw has adjustable blade for sawing close to limbs. Other saws for every need.

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Next Crop The Best Ever—

Prices of Hardie Sprayers have been reduced. Why be without the crop-improving, tree-saving *reserve power* of these famous sprayers any longer? Here you have the pump with 90 per cent wear removed—the wear comes almost entirely on soft cyclinder packings easily replaced. No crossheads; no guides; no complicated parts. The engine works only for PRESSURE—which is so necessary in reaching every square inch of fruit and tree in the shortest time with the least labor. Other Hardie values should interest you, too:—The Autoplex trucks—underslung and short turning; the light weight Cushman engine; the sand removing suction settling chamber; and the famous Hardie gun which does the work of two men with rods.

Write at once for catalog; take advantage of temporarily reduced prices.

DEPENDABLE HARDIE SPRAYERS

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BRANCHES AT:—
Portland, Ore. Los Angeles, Cal.
Kansas City, Mo. Brookport, N. Y.
Hagerstown, Md. Petrolia, Ont.

Red Raspberry Growing in Oregon

(*Continued from page 4.*)

The year 1916 found Ed devoting his full time to his home place. His eight and three-fourths acres of reds today are producing an income that would make the incomes of most quarter section farms look small. Mr. Spath has not only made his small farm a real income maker but has built a fine home and made it into a real place to live. An offer of $1000 per acre was turned down by Spath in 1920.

Practices Up-to-Date Methods.

How does he do it? By the most up-to-date methods he can secure. In 1919 he was picked out by County Agent S. B. Hall as the most likely small fruit demonstrator in Multnomah county. A grower to be a good demonstrator for his community must be a successful grower, who is wide open for any chance to improve his methods and increase his yields at a profit. He must also have the respect and confidence of his fellow growers. Ed had all of these qualifications and snapped up the chance to work with the county agent and extension specialists from the agricultural college.

He changed his training and pruning methods from heading back the canes to about 4½ ft. to 5 ft., retained between two wires, to a non-heading system, trellising the tall canes down to two wires stretched down the row 18 in. apart and about 4½ ft. from the ground. This one change resulted in earlier berries by about 10 days than any of his neighbors, his season continuing just as late as usual.

Soil Management.

The next change was in his soil management. Ed, like most farmers on virgin land, was drawing upon his soil fertility without putting anything back. He had used up the bulk of the nitrogen carrying organic matter, and his yields were beginning to drop. He was induced to adopt an annual cover crop of common vetch to be seeded in August and plowed down early the next spring. Ed went one better by hauling in all the old straw stack bottoms he could get hold of, supplementing the cover crop each spring with about three tons of this old straw before disking and plowing. He applied 250 lbs. of nitrate of soda per acre in addition, as recommended by the county agent. Three applications were made of this, one at about the time the buds started and the other two at three-week intervals. This resulted in a much greater cane growth, some of the canes reaching a height of 15 ft., and a greater yield of larger berries. The second year of this treatment brought in an additional feature which was not so desirable. The large yield of large berries was too soft to handle well. The canners kicked. The county agent called in the horticultural specialist of the Oregon Agricultural College and the problem was gone over with him. The result was a reduction in the amount of nitrate of soda from 250 lbs. to 100 lbs., the addition of 400 lbs. of superphosphate and 100 lbs. of sulphate of pot sh. This was finally changed to 250 lbs. of nitrate of soda, 300 lbs. of superphosphate and 200 lbs. of sulphate of potash. This combination of fertilizers, with the annual cover crop of common vetch and three tons of old straw per acre, has materially increased the yields and improved the soil wonderfully. Ed's average yields up to and including 1918 were two and one-half tons, and his maximum yield had been three tons. After the new trellising method and soil treatment, his four-year average yield has been three and one-half tons and his maximum yield four and four-fifths tons.

The 700 and some odd acres of reds in Multnomah are showing the effects of this kind of demonstrational work. Ed is using the best methods available and County Agent Hall is spreading the Gospel. If all the growers of the county had been as ready to accept the better methods as Ed was and followed them as persistently, they would have averaged $297.50 more per acre, increasing the average gross income for the county from this one crop over $200,000. Ed Spath is a real asset to his county and is recognized as such.

Sun-Scald of Grapes and Its Relation to Summer Pruning

by Arthur S. Rhoads

Missouri State Fruit Experiment Station

UNLESS the clusters of grapes are protected from the direct rays of the sun by an ample leaf canopy, they are apt to become scalded. Sun-scald of the berries is especially apt to occur on vines making a weak growth of foliage as a result of the lack of sufficient soil moisture due to meager rainfall or the failure to conserve it by adequate cultivation, the occurrence of hot drying winds, root-rot, lightning injury, or any other cause that detracts from the luxuries of the foliage. It also is of common occurrence on normally healthy vines that have been given a more or less heavy summer pruning in the belief that the admission of more light will stimulate the fruit to ripen earlier.

It is a common practice in many localities in the United States to summer prune grapes for this and various other reasons, but as this operation usually is practiced, it results in more harm than good. At present the best growers summer prune grapes only for the following reasons:

(a) To keep vigorous, rapidly growing vines within bounds when the growth is unusually heavy. When the shoots hang down to the ground it is desirable to trim the lower edges of the vine sufficiently to permit a good circulation underneath in order to avoid a lack of ventilation that may favor the development of black-rot and other diseases.

(b) To remove superfluous shoots such as those which arise from weak buds or from buds on the arms or trunks, unless these are needed for purposes of renewal.

(c) To facilitate the spraying of the fruit when the vines have made an unusually heavy growth.

(d) On young, non-bearing vines as an aid to training.

Except for the above purposes, summer pruning of American varieties of grapes should be avoided. The pinching, or heading back, of a vine to induce fruitfulness is a questionable practice with but few experimental data in support of it.

Summer pruning is done perhaps most frequently by those who were accustomed to practice it in European countries. These growers, however, fail to consider that the practices which may be applicable in the culture of the European or vinifera grapes do not necessarily hold with the American grapes.

In any case, it is folly to cut back at all heavily the new growth of the vine, especially that at the top of the trellis, shortly before the maturity of the fruit in the belief that the admission of more light will stimulate the fruit to ripen earlier. The clusters of fruit, unaccustomed to exposure to either full or nearly full sunlight, quickly acquire a coppery hue or become "bronzed," and, in severe cases, may become badly scalded on the exposed side, after which the injured berries merely rot or shrivel up instead of ripening. Even in case the berries on one side of the cluster merely become bronzed they ripen but slowly, requiring even more time to attain the degree of ripeness at which they are suitable for picking than those of clusters allowed to ripen under the protection of ample shade. Even when apparently well colored, such berries have more or less of an acid taste and never become as sweet as those of the clusters protected from the sun by ample shade.

In those vineyards examined by the writer during the past two summers, where a fairly heavy summer pruning was practiced, the grapes fully ex-

(*Concluded on page 47.*)

The Wild Huckleberry Harvest

by W. A. French

THE HARVESTING of the wild huckleberry begins, on a commercial scale, about the last of September, in the extensive huckleberry fields of the Puget Sound country. Farmers and "little landers," settled about the shores of the Sound, take part in the harvest, while many come from the cities in the hope of knocking a few dollars off the bushes and earning a meal ticket for the winter.

How the Berries Are Harvested.

It is impossible to pick huckleberries by hand, that is, it is economically impossible, because of its extreme tediousness. Hence originated the practice of "batting off" the berries. Many huckleberry harvesters use a triangular box three or four feet by each dimension and four or five inches deep. This box is carried in front of the berry gatherer and is suspended from the neck and shoulders by a strap or strong cord. Light weight being desirable, the bottom is usually made of canvas or some other strong cloth. Others prefer a larger box, or a common wash-tub. Branches of the huckleberry bushes, laden with fruit, are bent over the box, several smart raps given with a stick, and the berries rain into the box. Into the box with the berries come dead leaves, needles of the fir tree, bits of dead twigs, a few green berries, and a variety of insects that live on the bushes. To remove all this refuse matter, the berries are run through a specially constructed fanning mill and passed over screens. The fan removes the leaves and insects, and through the screens drop the small green berries inadvertently knocked off. Crushed berries and those overripe fall upon a moving "apron" and are carried away.

Thrives Especially Well In Burned Over Areas.

The wild black huckleberry multiplies in the footsteps of the lumbermen in the great Puget Sound forests, and it especially thrives in districts recently burned over. The Indians have a great contempt for the white man's method of raising huckleberries, or rather, neglecting to conserve them according to the redman's standards. "Bineby no more huckleberries," quoth an Indian berry gatherer, in nondescript English, whom the writer interviewed on the subject. "White man have no more forest fire. Indian, when he wanted good and plenty huckleberries, set fire to the woods. The old berry bushes burn up, heap plenty bugs burn up. New bushes come, plenty berries and big berries. Old bushes no good. White man no savvy huckleberries."

And it is even so. In the golden days before forest conservation was thought of, the lavish redman, merely to provide himself with "good and plenty huckleberries," was wont to fire whole townships of the untrodden wilderness and sacrifice enough good timber to build a dozen cities. He had a correct enough idea of horticulture, as any berry grower will recognize, but in these days of the ascendency of the white man some other and less expensive method must be found to procure good and plenty huckleberries.

The wild black huckleberry, it is said, cannot be successfully domesticated, though a species of blueberry is now to be had from the nurserymen and is warranted to survive the tame and secure life of the home garden. Experiments in improving the blueberry by cultivation have been conducted for the last 10 years with the result that berries three times the size of the wild variety have been produced and the yield increased to 3000 quarts per acre. The black and the blue huckleberry grow side by side in the Puget Sound country. The blue huckleberry of this region is quite distinct from the blueberry grown in the Eastern states.

Some of the migratory berry gatherers make their headquarters at some rural hotel or a farm house, while others go out with automobile camping equipment, which has the great advantage of mobility, the camp being easily shifted to new fields as necessity demands. On the shores of beautiful North Bay, in the heart of the huckleberry country, the writer met a solitary berry gatherer living cozily aboard a large but inexpensively constructed launch, equipped with all the comforts of home. When he found a good field of berries he anchored close in shore, leaving the boat all day in sole charge of his dog, while the master mariner ransacked the adjacent forest.

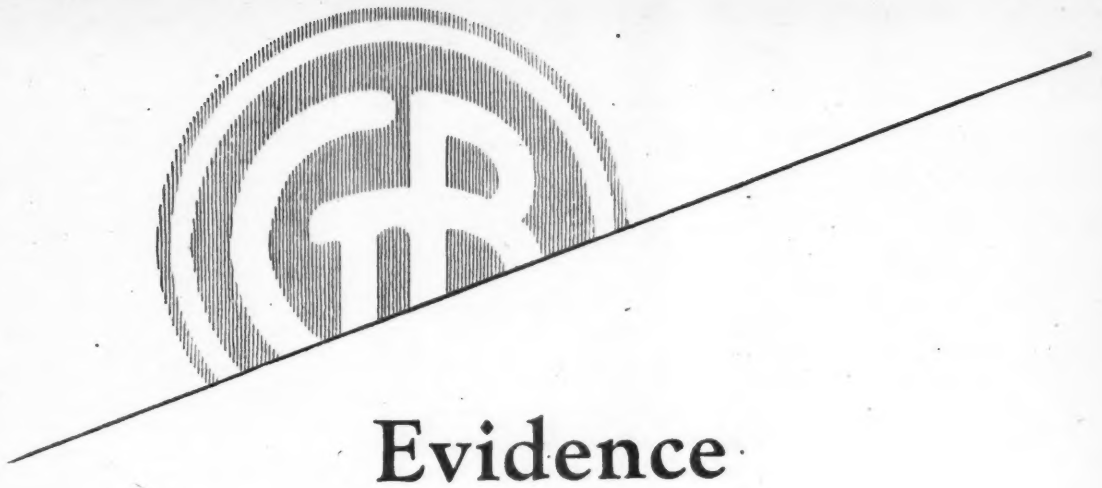
Old settlers in the North Bay region tell startling tales of the huckleberry yield of early days. Though the market price of the berries was then but two or three cents per pound, good wages could be made by the pickers.

Huckleberry Eagerly Bought.

The huckleberries are eagerly bought by the public markets, by commission houses and by the canneries. Prices to the gatherers usually range from 20 cents a pound at the opening of the season to as low as four or five cents when the thoroughly ripened fruit can be knocked off the bushes. An active worker will knock off 100 to 200 lbs. a day, though to do this he must find virgin territory where other gatherers have not taken away any of the berries. As usually practiced, it is strenuous work, for the gatherers are working under pressure, the days being short, and the fear of rain goads the pickers to speed up their efforts.

Berry buyers are to be found in the small towns of the huckleberry country, while those pickers who have conveyances of their own—automobile or launch—have the advantage of access to the primary markets. Great quantities of berries reach the markets by the parcel post.

Seattle and Portland are the leading huckleberry markets of the Northwest. Many berries are sold to the big bakeries, which bake huckleberry pies by the thousands. The berries are frozen and placed in cold storage until needed for pie manufacture. It is held that this procedure is preferable to using canned huckleberries, as the fruit loses much of its fine wild flavor in the process of canning.



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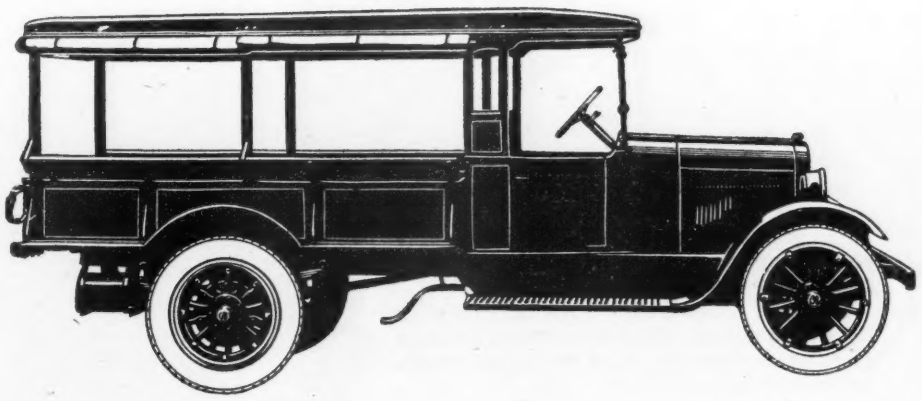

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Early in Spring

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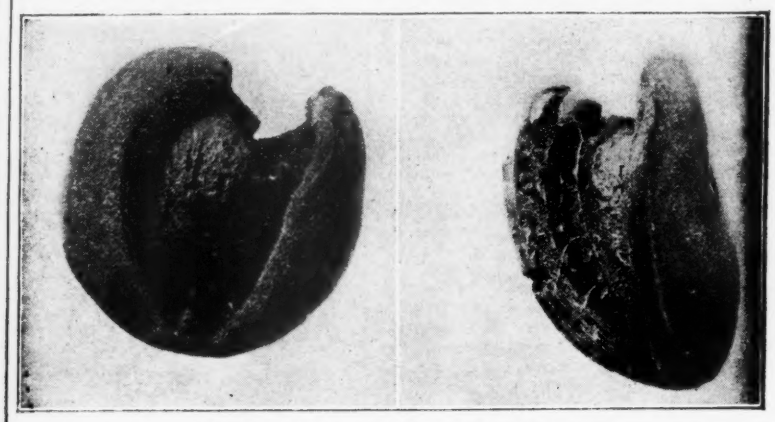
Dr. Wm. S. Myers, *Director*, CHILEAN NITRATE COMMITTEE
25 Madison Avenue, New York

The Almond

by F. W. Allen

THE STATE of California contains 50,000 acres of bearing almond trees, and nearly as many more which as yet have not reached bearing age. Although large importations are received from Spain, Italy and France, 98 per cent of the domestic supply is grown in California. Small sections in Arizona, Texas, Utah, Oregon and Washington produce the other two per cent. The explanation for California's apparent monopoly on the crop is primarily due to the early blooming habit of the tree. March first is the average date at which most varieties of almonds are in full bloom. In many instances, however, they begin to blossom a month earlier—at a time when most fruit sections are still experiencing freezing weather.



Almonds at the proper stage of maturity.

Almond Tree Similar to Peach Tree.

On account of this production being so localized, comparatively few would recognize almond trees when seen. In many respects the tree and its manner of growth is not dissimilar to the peach, to which it is closely related. The leaves are similar in shape but usually somewhat more narrow and of a slight grayish tinge. The main branches of the tree are often of good size and the younger bark smooth and of a mahogany red color. The fruit is, of course, quite different. Instead of having a thick, fleshy portion, or pericarp, as does the peach, the almond possesses a thin, leathery pericarp or hull. This hull becomes dry in September and usually splits open, exposing the nut inside. It is therefore the seed itself which is of interest in the almond. There are also two distinct types of this fruit—the sweet and the bitter almonds. The former are sold as fresh nuts to the commercial trade in large quantities and are in demand during the holiday season. Besides being a fine flavor they are a very highly concentrated form of food, possessing even a higher nutritive value than the grains. Blanched almonds are also used in large quantities by confectioners for candies, macaroons and the soda fountain trade. The general demand for shelled almonds is increasing and almond butter is now a new article of diet.

The bitter nuts—except when by mistake one may attempt to eat one—are largely used by nurserymen for the production of rootstocks upon which are budded the cultivated varieties. They are also in demand for the manufacture of almond oil, almond flavoring and prussic acid. Since the introduction of almonds in California some 70 years ago, much progress has been made in developing desirable commercial varieties, those producing large and regular crops; nuts with a thin shell and a large, well-flavored kernel. Today the Nonpareil, Ne Plus Ultra, the I. X. L. and the Drake stand at the top of the variety list and are in the greatest demand.

Ladders are not needed in harvesting the almond crop.

Pollination.

Crop production depends not only upon freedom from frost in spring but also upon the proper mixture of varieties in the orchard. For some undiscovered reason, the blossoms of any almond tree are incapable of fertilizing themselves or the blossoms of any other tree of the same variety. At least two varieties, therefore, must be growing in close proximity or no crop will be produced. Care must further be taken to know that these are not inter-sterile themselves and that they blossom at approximately the same time. With the varieties mentioned above, Nonpareil may be pollinated with Drake or Ne Plus Ultra but with I. X. L. it is inter-sterile. Contrary to popular opinion, pollination of fruit trees is not dependent upon the wind but upon insects, primarily the honey bee. Unless wild bees are numerous, it is recommended that one hive be placed on each acre of orchard.

Red Spider Serious Pest.

Aside from the regular spraying

(Concluded on page 49.)

Present Status of the Olive

by Christine Emery

IN THE century and a half that has elapsed since the first planting of olive trees about the early Franciscan Missions of southern California, the groves have continued to increase, receiving new impetus now and then as extensive tracts were planted, emphasizing the faith that others had come to feel in the future of this crop, although until 1900 practically the entire production was processed for oil.

Experimental work then showed that the green pickled fruit brought more remunerative returns, and later on came the assurance that the perfectly cured ripe fruit offered greater possibilities than either the oil or the pickles, for while Europe can, and does, supply 75 per cent of our demand for these two commodities, it cannot equal the quality of the ripe fruit which our people are learning to appreciate. The "soft flatness" of the foreign fruit is attributed to climatic conditions which, in maturing the fruit result in a pronounced "loosening" around the pith, which makes the processing of European ripe olives unsatisfactory.

Misfortune Falls Upon Growers.

Marking a period of patient progress, 1919 saw the light of promised reward glow like a golden gleam for the California olive growers, but the aftermath, which came from less than one dozen cans of ripe olives, packed in glass and imperfectly sterilized, brought cold and crushing calamity. Because of the social and financial prominence of the victims and the novelty of the product, ripe olives suddenly ceased to be a commercial asset. Instead, they became a liability whose very presence portended disaster in the mind of the multitude, and grocers not only took them from their shelves but hurriedly packed them back into shipping cases and endeavored to forget that such a commodity existed!

Coming in the first stages of the annual pack, the experience lost the eastern market, though Californians, knowing the ripe olive, its gustatory appeal and its nutritive content, rallied to the support of the stricken industry.

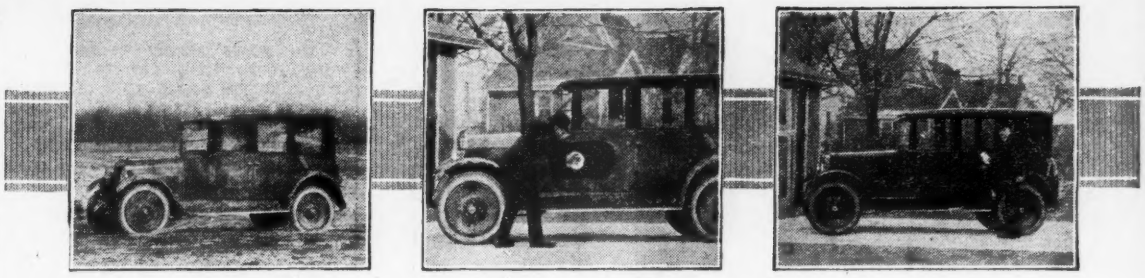
Owing to limited financial backing it was difficult for the California Olive Ass'n to combat the baneful effects of the adverse and widespread newspaper publicity, although a four months' campaign convinced them that it was useless to "tell the public" until the confidence of the retailers had been restored and they were taught the value of the product they had so hastily hidden away.

Retailers Get the Facts.

Consequently, an effort was made through the trade publications to tell the retailer the facts. He was shown that ripe olives were a pure, natural, wholesome food; that the canners were co-operating with the requirements of the State Board of Health and that because of their one fall from grace (which was of botulus origin and similar to conditions occurring with common frequency in widely advertised brands of canned vegetables), ripe olives were, and, in all probability, would continue to be, actually the safest sort of canned food on the market.

Meanwhile thousands of people were pouring into California. The greater portion of these were tourists who had grown to look upon the ripe olive with chill and hostile eyes, for assuredly ripe olives were not eaten in the east, but oh, what a difference in California!

On the diners, in the hotels and cafes up and down the coast, in homes throughout the length and breadth of the state, they not only "encountered ripe olives," but found they were accorded the honor of classification as a staple food, and seeing that the populace survived and actually seemed to thrive upon this delectable addition to the daily menu, they became emboldened to the point of taking a few cautious nibbles and quickly



Oakland's New Finish Makes This Possible

1 You can drive a True Blue Oakland through rain and mud for weeks, allow the spattered mud to remain on the finish

2 And then—quickly and easily wipe off this dirt and mud with any kind of cloth, using no soap, water or compounds

3 So that—the original lustrous body finish of the car is restored in all its beauty without a damaging scratch or mar!

UNTIL now—there has never been a really enduring automobile body finish. For twenty years manufacturers have striven to develop a product more durable than the finishes inherited from the days of horse-driven carriages.

Through all these years, buyers have admired brilliant and beautiful new cars. Yet while they admired, they knew that, at best, the delicate finishes of these cars would be dimmed and aged after a few short months of ordinary usage. But no enduring body finish was available that would withstand the constant daily use to which automobiles are increasingly subjected.

Happily, those days are gone forever! Oakland has revolutioned motorcar body finishes by adopting and perfecting the application of a radically different substance—*Duco*. It is a beautiful, durable, weather-proof coating, impervious alike to sun and wind, rain and snow, salt air from the sea and the alkaline condition of deserts.

Oakland's Special Satin Finish retains its newness indefinitely. Wiping with a dry cloth will restore its original lustre, without scratching, even though the car be covered with dust, rain spots, mud, oil or tar. And it is a fact that the more frequently the finish is rubbed, the more beautiful it becomes.

Oakland's Special Satin Finish is more than capable of meeting the severest demands of all-season motoring. Even sulphuric acid, or the chemicals of fire extinguishers, have been sprayed on it, and then wiped off, leaving no marring trace. Certainly, therefore, no road or weather condition met anywhere in country or city driving, winter or summer, can harm this remarkable finish.

While durability is its prime virtue, everyone who has seen this new finish enthuses over its beauty and individuality. Its satiny sheen is distinctive and different. It breathes refinement and richness.

How fitting that the True Blue Oakland—the car with the new six-cylinder engine, four-wheel brakes, permanent top, automatic spark advance, centralized controls, and so many other exclusive features—should be the first car to offer this remarkable finish!

This—in itself—is reason enough why you should see the True Blue Oakland before buying any new motor car, regardless of price.

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Dunlap, Dr. Burrill, Warfield, [illegible]000, Gibson, Pocomoke, $3.50; Aroma, Collins, Campbell's Early, Brandywine, Sample, Missionary, Klondyke, Bubach, Premier Eaton, Bun Special, Uncle Sam, Big Late, Big Wonder Delicious, Marvel, Prize, Nick Ohmer, Glen Mary, Wm. Belt, Excelsior, $4.00; World's Wonder, Big Joe Crampton, New Cooper, $7.00; Champion Evebearing, $8.00; Concord Grapes, $20.00; Cumberland, Plum Farmer, Kansas Black Raspberries, $12.50. Any following $1.00 (or any 6, $5.00): 125 Strawberries, 50 Champion Everbearing, 36 Raspberries, 15 Grapes, 75 Asparagus, 15 Rhubarb, 36 Gladioli, 4 Bridal Wreath, 6 assorted Ornamentals. Catalog.

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Harrison's Trees are grown in our own immense Nurseries—the largest of the kind in the world. The buds are cut by careful men, long in our employ, from our own bearing orchards. Every precaution is taken to assure trueness to name and a select strain of each variety. We have millions of Fruit Trees, ready for immediate shipment—tall, strong and straight. Apple, Peach, Pear, Plum and in four money-making varieties. Small Fruits, including Early, Mid-Season and Late Strawberries.

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"The Largest Growers of Fruit Trees in the World."

capitulated to the call of the ripe olive.

Two years slowly passed. They were years that, despite the light crop and the dependable oil market, brought the pressure of persistent effort upon both growers and packers, for aside from the loyal California trade, the sale of ripe olives ceased to be a tangible thing.

Barrier of Suspicion Swept Away.

But all the while the barrier of ignorance and suspicion was being swept away. So slowly and gradually had this come about that even the packers were amazed at the orders that were wired in during the early fall months, for the tourists upon returning to their homes began to "ask for olives" and the retailer, with honest appreciation of a good article, put them on display and then bought from the jobber, and the jobber, upon clearing out his stock, appealed to the packers, with the result that practically all of the accumulated pack had moved from the warehouses before the vanguard of the 1922 harvest entered.

The California Olive Ass'n had its inception as an advisory board. Its purpose was to furnish authoritative information regarding tariff, legislation and advertising. This association was financed by a box levy assessment from its members and all olive growers, including those who, through a mistaken sense of economy, failed to aid in furthering the scope of this organization have undoubtedly reaped the benefits accruing from its active, analytical, aggressive work, which, especially during the protracted depression, was to consistently and enthusiastically advertise California Ripe Olives.

The result of such unceasing publicity is convincingly shown by comparing the sale of the 300 cases of ripe olives—which was the sum total of the fruit shipped east in the two years immediately following the boycott—for in 1922 an intensive "educational campaign," limited far too seriously by lack of funds at the command of the organization, sold exactly 3,000 cases of ripe olives in three months!

California Olive Growers' Ass'n Formed.

However, this organization, excellent though it was, dealt with the olive after it had passed from the hands of the growers and had become a packed product, and it became evident as time passed that in order to secure a basic co-operative foundation upon which they could build successfully, that organization should begin with the growers, so in January, 1922, the California Olive Growers' Ass'n was formed.

The object of this newer organization is to place the olive growing industry upon a sound, co-operative basis, following the lead of the commendable working organizations now in control of the citrus, raisin and walnut productions, and as the proposition was based fundamentally upon the co-operative unity of the growers, it became the first duty of the directorate to get the 8,000 acres of highly productive olive groves enlisted in the enterprise, and the project, which won the almost universal approval of the growers, has "signed up" this acreage so successfully that even the pessimists have been swept into line by the certainty of the outcome.

The nine directors—three each were chosen from northern, central and southern California—will upon completion of listing of the acreage, appoint a manager, who will, under the supervision of the nine, have charge of the affairs of the association. The directors, who themselves were chosen by a committee of 25 members of the organization, are men who have proven their ability to direct, on sound business principles, an organization of this kind, and it soon becomes evident that no individual grower or packer or small co-operative assembly of growers or packers could secure the services of a man, who, as manager of an association that is more than "state wide" in the scope of its everyday activities, must have the verve, vision and skill to maintain the superlative degree of efficiency that is demanded by all large organizations.

Headquarters at Fresno.

Fresno, strategically located in the centre of the state, is also the centre of olive production and, more important still, it is the heart and brain of co-operative enterprise within the state for "bigger business"—more legal, executive and doctrinally sound business, representing the keenest acumen and co-operative activity in the country—makes it logically the environment in which the Olive Growers' Ass'n can best control its own destiny.

The primal purpose of the association is to make the olive groves of California an asset, rather than a loss, to their owners; to rouse all growers, both active and prospective, to the vast possibilities that even a national utilization of the olive and its products represents; to standardize the pack so that regardless of the brand under which the product is sold, the consumer will find a uniform grade of California olives and oil in all markets.

Heretofore packers operating outside the California Olive Ass'n had no set standard or specifications for pack other than their own individual gradings and, in the case of ripe olives, the complete sterilization process made emphatic by the State Board of Health.

The Olive Growers' Ass'n will Standardize, Advertise and Popularize the olive products of California and by so doing will get a better grade of oil and a far more satisfactory pack of ripe olives to the consumer at a price which will place both commodi-

Mammoth tanks in which olives are processed.

ties within the means of the great buying public. The present high price of ripe olives is due to unorganized production, diversity of pack and insufficient commercial distribution. The olive, and particularly the ripe olive, must be removed from the condiment class and placed before the people as a canned product, a food and not a condiment.

Standardization of Planting Necessary.

Standardization of planting is a feature that is to be brought to the attention of the growers, for upon it will hinge, to a large extent, the outlook for future production. Many varieties of olives, both large and small, now cumber the groves of California in much the same manner that the unenlightened farmer stocked his farm with undesirable cattle and continued to carry them at a loss.

The well-known Mission olive, which is a strictly California product, is conceded to be one of the best varieties that can be grown, both for ripe olive production and oil processing. We have come to think of the Mission as a typically small olive but the size varies according to the set of the fruit and cultural conditions as it runs from medium to large if the crop is light and the care is of the best. The tree is a sturdy grower and as it makes ideal wind breaks and dust screens, it is invaluable for roadside planting. It is almost impervious to attacks of knot disease but because of their upright form of growth, trees of this variety require severe pruning whenever conditions that promote an excessive growth of wood are encountered.

The Manzanillo olive is of Spanish origin and the name literally translated means "little apple." The fruit ripens earlier than the Mission variety and because of this, is desirable in localities where a fall frost would mean ruin. It is larger and of softer texture than the Mission, necessitating more careful handling in both picking and processing. This is true of all of the so-called "colossal varieties." The Manzanillo tree is of the much desired broad, spreading type and the processed fruit is, in the opinion of many, of unsurpassed excellence.

The Ascolano, an olive of Italian importation, is the largest fruited type grown. It is of a deep wine color when ripe, in marked contrast to the jet black sheen of the other varieties, and the fruit is used mainly for fancy pickling.

The Servillano is a Spanish olive that is generally known as the "Queen." It grows to a phenomenally large size and is utilized for green pickles, for because of its extremely soft texture it must be processed before reaching maturity. It is more susceptible to frost than the other varieties and for that reason should be planted in absolutely frost-proof districts. The tree is a vigorous grower and a reliable cropper and, like the Ascolano, is now being set out in large areas in order to supply the demand created in the eastern markets for an exceptionally large fancy fruit.

Fruit Is Hand Picked.

The greatest care is exercised in picking all olives. In the old days the trees were shaken and the fruit picked from canvas spread over the ground. Modern needs have introduced new methods. All of the fruit is hand picked and in many cases, and always with the larger and softer fruits, they are picked into pails of water and from these carefully placed in felt-lined containers for their journey to the packing plants, and every precaution is taken to insure the attractive appearance of the "finished product."

California, with her wide climatic range, offers ample illustration of the adaptability of this crop, for olives are grown commercially in 36 of her 58 counties. This olive area is, however, grouped into three especially favored districts, namely, northern, central and southern. California, including the San Francisco Bay region, Sacramento, San Joaquin, Riverside, San Bernardino, Ventura and Los

(Continued on page 32.)

When you plant trees, insure their lives!

IT has been proved that trees planted in blasted soil have a much better chance for life the first year, will bear earlier, and yield greater crops. Dynamiting the soil before planting trees actually means "life insurance" applied to your orchard!

This year, you can blast tree holes at less expense than ever before—with Dumorite, the new du Pont dynamite.

Dumorite is non-freezing. You cannot get a headache from handling it. It shoots stick for stick with 40% dynamite—*and you get ⅓ more for every dollar you spend.*

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East, west, north, south, is now being sprayed with "Friend" Sprayers. Because they have greatest adaptability to all conditions, "Friend" Sprayers are manufactured (not assembled) sprayers. They are low down, short turn, large wheel, easy draft, high power. The "Friend" motor pumps that furnish the high spraying pressure are wonderfully simple and durable. Write to nearest "Friend" distributor or direct to

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Used for SEALING, GRAFTING, PRUNING AND BUDDING TREES

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Made in Red, Black, Brown and Gray Colors
5 pound can.....$2.50
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TELLS how to get big profits from windfalls and small, sound unmarketable apples. Gives facts and figures, based on experience of orchardists and custom pressers. Illustrates and describes Mount Gilead Hydraulic Cider Presses and allied equipment. Write for this Free book today.
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By buying a Fordson with Johnson TRACKPULLS you can work successfully where only crawler tractors can be used.

Full length, "muley" type tracks provide one thousand square inches of traction surface. Soil pressure is reduced to approximately 3½ pounds to the inch, much less than the pressure of a horse's hoof.

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The character of the material and construction of the TRACKPULL is in keeping with the well known mechanical excellence of the Fordson Tractor, and it is designed to meet all requirements where the conditions are such that wheel tractors cannot be used.

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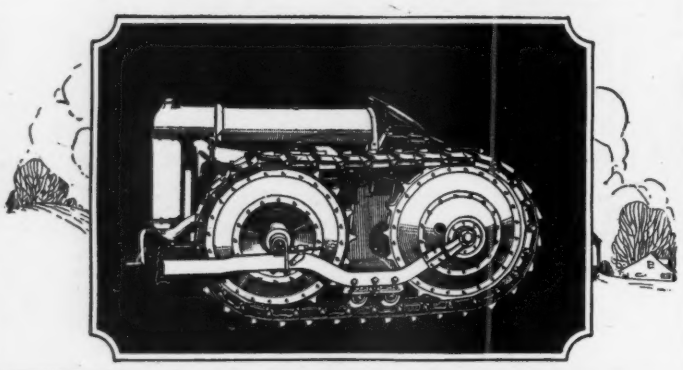

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BEAN SPRAYERS

(50-B17)

Coaxing Profits Out of the Farm Orchard

by William A. Freehoff

AT A MEETING of the local chamber of commerce, the merchants were discussing the complaints some of the farmers were making relative to marketing apples.

"We can't get a decent price for our apples," the farmers insisted. "Hundreds of bushels are rotting under the trees."

"I went out to one of these farms," a dry goods merchant explained, "with the idea of getting some cheap apples. I certainly was willing to do my share to keep them from rotting. The farmer offered me all I wanted at 25 cents a bushel, but I wouldn't have taken all the apples in his orchard as a gift. I wouldn't have known what to do with them.

"So I went down the line a little farther, to a farm orchard I had heard about. I refer to Cornfalfa Farms, owned by Swartz Brothers. They charged me $1.75 a bushel, and when I asked for two bushels, they said they were sorry but could allow only one bushel to a customer."

There is the nub of the farm orchard situation. One man complains that he can't sell his apples and permits them to rot under the trees—and in many cases that is about all the apples are good for. The other man, like Swartz Brothers, of Waukesha county, Wisconsin, can't supply the demand at a good, stiff price.

Wormy windfalls, bruised and battered and packed carelessly in any old container with leaves and twigs, are not attractive to the purchaser, will not keep and are practically unfit for food.

Peter Swartz, of Cornfalfa Farms, has been one of the leaders in Wisconsin in preaching better care of the neglected farm orchard. When he came into possession of his farm he found on it a large orchard of about 40 acres, with no revenue worth while being wrested from that portion of the farm. He hated to root up all those fine old trees, which had been planted with such care by his father. So he went down to the College of Agriculture and to the Wisconsin Horticultural Society and haunted the men there until they gave him the remedy. That was to prune out the deadwood and spray for clean fruit. Then, finally, he was instructed in the grading of apples and the best ways to market his crop.

Last fall he picked five barrels of apples from one tree and sold every apple at the top of the market. Peter Swartz applied his merchandizing genius to the problem and now regards these old orchards as one of the most profitable departments of Cornfalfa Farms.

Not every farmer has a 40-acre orchard, however. Most farm orchards are from one to five acres in extent, and for such orchards few farmers would care to do what Swartz did—invest in expensive power sprayers. It is also true that only few farmers take the trouble to learn how to prune and spray properly; and when they do know how, spraying operations usually come just at a time when other farm work is pressing. There is not very much hope that many general purpose farmers will ever take proper care of their orchards. The commercial apple growers have, of course, learned their lesson a long time ago.

Wisconsin is a state of considerable importance as a commercial apple growing section, by grace of Door county, the Kicapoo Valley and a few other regions especially favored by nature. In the main, it is the home of the small, neglected farm orchard, which in too many cases does not even supply the owner with enough apples for his own table use.

Under the leadership of F. R. Gifford, several Wisconsin counties which had county agents were persuaded to put on a campaign for the establishment of spraying rings. One of these "rings" consists of from five to 15 farmers, who band together for the purpose of co-operating in the spraying of their orchards. Gifford organized this work so that pruning demonstrations were held in those counties which were planning on spraying for the first time. Unless a lot of the deadwood and diseased branches are removed, spraying cannot be 100 per cent effective; and even then the first year's results are not as good as the second. All the men attending the demonstrations are asked to bring saws. After a 15-minute discussion of pruning the neglected orchard, six to 15 men, in groups of three, do the pruning. The axe is often used on badly diseased trees and undesirable varieties. The men then go from this demonstration to their own orchards, where they apply what they have just learned.

Spray rings, consisting of farmers closely grouped, are then organized. It is best to buy a power sprayer, costing from $300 up. While it is impossible to estimate the exact cost of spraying, the Wisconsin experience showed that by using power outfits and spray rings, with 15 members to the ring, it cost about 30 cents to the tree. Some groups brought this cost down to eight cents, but this is an exception.

Usually an expert is hired to operate the outfit and do the spraying. Such a man will have to be paid from eight to twelve dollars a day. In many cases he also supervises or does the necessary pruning. In the average spray ring in Wisconsin, it cost the member farmers about $30 each for the outfit. In every case where they had fruit, the farmer paid for his share of the cost the first year. It happens, of course, that a killing frost may come at the last minute, and then nobody will get any fruit.

To get clean apples is one thing; to sell them is another proposition. The farmers of Jefferson county, Wisconsin, had some trouble in getting their local merchants to handle them. These merchants had been so badly "scorched" by unreliable home grown apples that they were prejudiced. "Nothing doing" was the unanimous verdict. So the county agents went to one of the merchants and asked permission to use his window display. This was readily granted. Then a most attractive display of home grown apples was put on, and it wasn't very long before a stream of customers was drifting into the store. By afternoon a competitor called up the county agent and wanted to know why Mr. A was getting a monopoly of the apple business.

"Oh, so you are willing to give us your window?" was the quick reply. Before long all the grocers were handling local apples. The grocer who made the first trial said at the close of the first day's business that his sale of apples for that day had exceeded his entire sales for the week preceding. While he had made as much commission per pound on inferior fruit, his net sales of the farm packed apples were much larger.

The seemingly impossible had been accomplished. The producer had found a profitable market almost at his door; the grocer was reaping larger profits; and the consumer, the best satisfied person of the three, had learned that local apples were as good, if not better, than the "imported" ones.

The farmers of these Jefferson county spray rings chose one of their members to be sales manager. Every member consigned his fruit to the manager, who turned it back to the grower if it did not come up to the desired standard. As the price had already been established, all that was necessary for the sales manager to do

(*Concluded on page 30.*)

Orchard Problems and their Solution

by Paul C. Stark
Associate Editor

Top-Working Undesirable Sorts

My trees are a miscellaneous lot of varieties, some of good quality, but mostly rather poor eating apples, such as Ben Davis, Missouri Pippin, etc. Am finding it harder each year to sell the poorer quality sorts, while my good apples sell well. I have six acres of orchard, about one-third good varieties. What would you advise doing with the others? My trees are 15 years old.—C. T. B., Indiana.

YOU HAVE a difficult condition and unfortunately there are many others in the same fix. Some years ago the orchardist planted orchards of apples without giving consideration to the growing demand of the public for good apples to eat. The public has become educated to good quality and the poor sorts sell at a big discount, and this sentiment is growing stronger and stronger every year.

If your trees are in fairly good condition, you can topwork them to good quality sorts that sell at good prices. With a few good varieties you can get far greater profits than with a miscellaneous list containing undesirable sorts.

Your Ben Davis trees will not make good stocks on which to top work as they are very susceptible to blister canker and some other pests; however, if in fair condition, I would topwork them even if they do die earlier than other sorts.

If you plant any more orchards, give careful attention to your variety list and plant apples that the public will want to eat. That, in my opinion, will do more to increase consumption of the fruit crop than any other factor.

Lime on Sour Land

I have planted a young orchard consisting of different kinds of fruit trees. The ground is more or less sour and I wish to ask if it would injure the trees if I would lime the ground and plow same under, and if not, approximately how much lime would it take to the acre?—E. S. H., Illinois.

THE USE of lime on sour land is almost sure to bring good results, regardless of the crop which is planted, although an orchard is not as greatly affected by acid soil as are legumes, like clover, alfalfa, etc. It is not necessary to plow the lime under, however, although it makes little difference whether this is done or not as far as the trees are concerned. The best way to apply lime is to sow it broadcast and then let the ordinary cultural operations get it into the soil. Finely ground agricultural limestone is preferable and usually cheapest.

The amount of lime which should be applied at one time in an orchard depends upon the acidity of the soil. As a general rule, two tons to the acre will be sufficient. This can usually be determined by poor growth of leguminous cover crops which do not thrive on acid soils, or by free analysis by your State Experiment Station.

Early Spring Spraying

How early would it be advisable to spray fruit trees for scale in the spring? Should I wait until the buds begin to swell or make the application with the first warm weather?—O. T. M., Illinois.

AS A GENERAL rule, it is preferable to make the dormant spray application late enough so that it will serve to control aphis as well as scale insects. This usually means waiting until the buds begin to swell and the leaf tips have not emerged over one-fourth inch. This "green tip" stage is usually designated as the time for making the delayed-dormant spray which will take the place of the dormant spray in most instances. In very large orchards it is necessary to start somewhat earlier so as to be sure the spray is applied before it is too late.

The chief objection in spraying too early is not only that the insects are less active and most resistant in this early period, but in cold weather the spray material may break down and be injurious to the tree. Scalecide, for instance, should not be used when the temperature gets below 40 degrees Fahrenheit.

Nitrate of Soda vs. Sulphate of Ammonia

Which makes the best source of nitrogen for fruit trees—Nitrate of Soda or Sulphate of Ammonia?—S. C. P., Kentucky.

THE DIFFERENCE in effect between the two common sources of nitrogen is very little. The basis, therefore, to be used in making a choice must be that of cost or the ease of securing the fertilizer.

Sulphate of ammonia contains about 20 per cent more nitrogen than nitrate of soda, but the cost is usually high enough to make up for this difference. It must be used, however, in correspondingly lesser amounts on the trees to give an effect equal to that of nitrate of soda.

On some soils where additions of lime must be made, it is claimed by some that sulphate of ammonia is preferable because of certain residual effects that result from an excess of alkali in the soil. On the other hand, some claim that nitrate of soda would probably be the better fertilizer to use on slightly acid soils, as it does not add any acid and, in fact, its residue is alkaline in reaction.

Early Spring Plowing

Is it beneficial to plow an apple orchard as early in the spring as possible, or wait until after bloom?—S. B. A., Kentucky.

THE MOST important benefit to be gained by spring plowing is the liberation of an early nitrogen supply which will aid in increasing the vigor of the tree and consequently the set of fruit as well. Thus, it is of vast importance to plow the orchard as early as possible in order to open up the soil and increase the bacterial action which liberates the nitrates. Many times a wet spring will make it impossible to plow very early, but as a rule, it can be done a week or two before the blossoms open. When plowing does not precede bloom an increase in the set of fruit can usually be obtained by an application of nitrogen fertilizer, such as nitrate of soda or sulphate of ammonia.

Another important benefit of early spring plowing is the turning under of the old leaves. This destroys the source of the greatest amount of scab infection and plays an important part in controlling this apple disease.

Fillers for Quick Profits

What are the best varieties of apples I can use for fillers? My permanent trees are of the Stayman and Stark Delicious variety.—O. R. K., Pennsylvania.

THE BEST varieties of apples which are suitable for fillers are those which are more or less erect in growth and which bear at an early age. Two of the best varieties for your section of the country would be Yellow Transparent and Golden Delicious. The latter in particular is a very early and heavy cropper. A good income would be secured from the trees long before they would need to be removed. Other varieties suitable for fillers are King David, Duchess, Wealthy and Rome Beauty.

It Pays to Treat Your Orchard Right

Nitrogen (usually termed ammonia) is the most potent of all fertilizing agents in promoting the vigorous wood growth so necessary to the formation of fruit spurs and fruit buds. On the other hand, the failure of fruit to set and the early falling of fruit is due, nine times out of ten, to *nitro starvation.* In some cases an early application of quickly available nitrogen has increased the yield of fruit two or three fold.

Don't *you* rob yourself of your rightful profits by starving your orchard.

Apply Arcadian Sulphate of Ammonia, 150 to 300 pounds or more per acre, according to crop and soil type.

Arcadian Sulphate of Ammonia is kiln-dried and screened to make it fine and dry for top-dressing purposes. Ammonia 25¼% guaranteed. For sale by leading fertilizer dealers.

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For exact information as to time and amount of application see our fruit bulletins—the records of actual orchard experience. They tell you how fruit growers have increased their yield and profits. In writing for bulletins use the coupon below.

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- ☐ No. 8. "The Use of Sulphate of Ammonia in the Fertilization of Peaches."
- ☐ No. 9. "Arcadian Sulphate of Ammonia—The Perfect Ammoniate."
- ☐ No. 10. "Fertilizing the Apple Orchard."
- ☐ No. 13. "The Use of Sulphate of Ammonia in the Apple Orchard."
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WITH THE CO-OPS.

IN OUR November, 1923, issue, there appeared in this department a short article regarding the election of officers of the National Pecan Growers' Exchange.

We wish to advise our readers that this should have read the "National Pecan Growers' Ass'n." The National Pecan Growers' Exchange, located in Albany, Ga., is a marketing organization, receiving the pecan crops of its members, grading them for market according to their own standard brands and having no connection with the National Pecan Growers' Ass'n. The National Pecan Growers' Ass'n, on the other hand, is for the purpose of disseminating a knowledge of better cultural methods among its members, making for closer fellowship among its members and, in general, promoting the interest of the pecan industry in every way possible.

Officers of the National Pecan Growers' Exchange are as follows: William P. Bullard, president and manager; C. Kirkpatrick, first vice-president; W. H. Born, second vice-president; Harold B. Taylor, secretary-treasurer.

THE MOST important question among the co-operative associations and the one causing the greatest difficulty is the financing of the organization. It is the rock upon which most of the wrecks of co-operative movements lie stranded, and those associations which are successful today are ones which have succeeded in overcoming the financial obstacles.

For several years a co-operative organization in the Yakima Valley, state of Washington, has handled this problem successfully. This is the Yakima Fruit Growers' Ass'n and some of its experiences are interestingly narrated by Charles H. Swigart, general manager.

"The service rendered by the association to its members," he explains, "includes not only selling their fruit, but financing their operations by the sale of spraying materials, orchard supplies, etc., during the early part of the season, long before the fruit is ready for harvest, so it often requires large credits to handle this work. Not only does the association finance the growing of the crops to this extent, but at harvest time, as soon as fruit is picked and delivered to the warehouse, advances are made to the growers on their receipts at the warehouses, which may be one to several months in advance of actual returns from the sale of the fruit. This imposes an additional financial burden and problem.

"It was the difficulty in getting sufficient credits that led to the reorganization of the association in 1918. Up to that time it had consisted of a sort of federation of district associations, each of which had its own board of directors and separate management, though sales were handled through a central office.

"In the reorganization, authority was centralized in one board of directors, and contracts ran to the central body instead of to the district association.

"This made it possible to issue preferred stock in the association, and later to issue bond when required by growth of the association and need of new facilities."

THE ANNUAL report of the Federated Fruit and Vegetable Growers for 1923 has not been completed as yet but the figures and facts already compiled show a successful year. A moderately good surplus has been accumulated above operating expenses. The total volume of business fell considerably short of early estimates due to adverse weather conditions in one or two of the more important districts, nevertheless the total year's business was good in volume.

At the meeting of the New York State Horticultural Society at Rochester, during January, John F. Deegan, General Sales Manager of The Federated Growers made this statement: "The corner stone and foundation of sucessful co-operative marketing is standardization. Many co-operatives fail because they skip over this important phase and attempt to build a structure from the first story up, but without an adequate foundation. The basis of successful merchandising of a fruit crop lies in standardization and without it any f.o.b. program must, of necessity, fall to the ground. If any group of growers get together in a co-operative way and expect to pass over standardization, they may as well forget any idea of merchandising in an f. o. b. way, save themselves time and trouble and just dump their goods on the market, selling for what they are worth and take anything that may come back."

AN AGREEMENT has been reached by the three co-operative growers' associations of North Central Washington, the Wenatchee District Co-operative Ass'n, the Skookum Packers' Ass'n and the Wenatchee-Okanogan Co-operative Federation, for the joint purchase of supplies, use of a written sales contract, exchange of all vital sales information and joint prosecution of flagrant rejections.

A committee consisting of one representative from each of the three associations will be named to act as a clearing house for the purpose of carrying out the objects of the agreement.

GROSS sales of the Arizona Citrus Growers' Co., Phoenix, Ariz., for the fiscal year ending August 31, 1923, amounted to $305,663, according to the annual statement. Disbursements to growers amounted to $229,698; the expenses were $67,776; and the profits for the year were $8,215.57. A 10 per cent cash dividend was paid, also a 33⅓ per cent stock dividend.

Fruit shipped was as follows: Grapefruit, 35,611 boxes; oranges, 34,379 boxes; tangerines, 935 boxes; lemons, 674½ boxes; making a total of 71,599½ boxes. After deducting certain charges for loose pack and culls, the operating and overhead expenses amounted to 79.01 cents per box.—*Agril. Co-operation.*

DURING 1922 reports from 667 farmers' business organizations showed sales of fruit having a total value of $183,338,970. More than 100,500 cars were handled by these associations. The following table gives detailed information of the fruit sold:

Kind of fruit.	Number of associations.	Number of cars.	Value.
Citrus fruits..	323	43,520	$71,690,377
Raisins	1	6,200	35,419,724
Apples	130	12,646	11,095,801
Grapes	44	9,670	7,289,130
Strawberries..	95	5,283	5,552,988
Peaches	38	4,670	5,128,598
Cranberries ..	4	1,660	3,856,510
Pears	32	3,150	3,450,000
Misc. fruit....	..	13,720	39,905,842
Total	667	100,519	$183,388,970

A RECENT report of the manager of the California Almond Growers' Exchange to his directors states that the total membership as at December 12 last was 3,338, a gain since April 1 of 340 members. The Exchange had delivered to it by its members approximately 7,000 tons of almonds of the 1923 crop.

The Story of Dale Bessier

(*Continued from page 4.*)

home. Nature has made things handy for him in this matter. In all America, no more inspiring autumn scenery may be found than in Brown county, Ind. The fine stretch of concrete leads the week-end tourist and the Sunday pleasure seeker into a wild region of deep declivities, noble virgin forests, long slopes, winding roads, steep climbs, peaks, rushing trout streams and waterfalls and the leaves on the trees are painted in more varied tints than anywhere the most widely traveled tourist can recall. The roads are crowded to capacity on autumn Sundays. Automobiles bearing the license tags of many states whiz along the highways and at times it appears that Indianapolis, a city of 350,000 people, only 40 miles away, has moved, temporarily, down to Brown county. It is easy to see how Dale Bessire got the idea of marketing direct and at home!

"I am going to have the apples out in the orchard in plain view of this passing throng, when the color gets out in the woods," he says. "These tourists have forced me into the most profitable marketing system I have ever tried. Instead of having to cultivate and build up a home market, they have stopped and demanded the fruit and from now on, I am going to meet them half way." The ideal marketing condition in any line is for the ultimate consumer to find his way to the place of production and buy for cash. Indirectly, the same grand, natural scenery that has brought artistic folk of high degree to live in Brown county has made a direct market for Dale Bessire's juicy apples. They come in droves from the city, hemmed-in and artificial, hungry for natural beauty. They go back with the sentiment satisfied and with a few bushels of Winesaps or Grimes Goldens as souvenirs of a happy day.

Three Essential Requirements.

Mr. Bessire gave three prerequisites for success in the business he is in. He says, "I think to succeed as an orchardist a man must love fruit and all growing things. He must be willing to work diligently and intelligently with his head and his hands. He must have the right kind of a wife, and to be honest about it, I feel that the last should come first."

With a fine cultured wife and three growing, care-free children, here is a man that temporary misfortune lead into permanent success and happiness, into a career so unusual that it can scarcely be duplicated in America today. With a lot of disadvantages to overcome in a field new to him, intelligent effort again has been seen to triumph. He had this fine thing in his favor—he had no lessons to unlearn, no self-satisfied complacency to lull him into failure. With an open mind, he laid his business foundations on correct principles and the money and fame that has come to him is his reward. "Indiana's apple king," they call him and many tourists and information seekers who visit his pleasant home in the highlands go away saying, "He has been well named, for the kingliest thing in the world is kindness!"

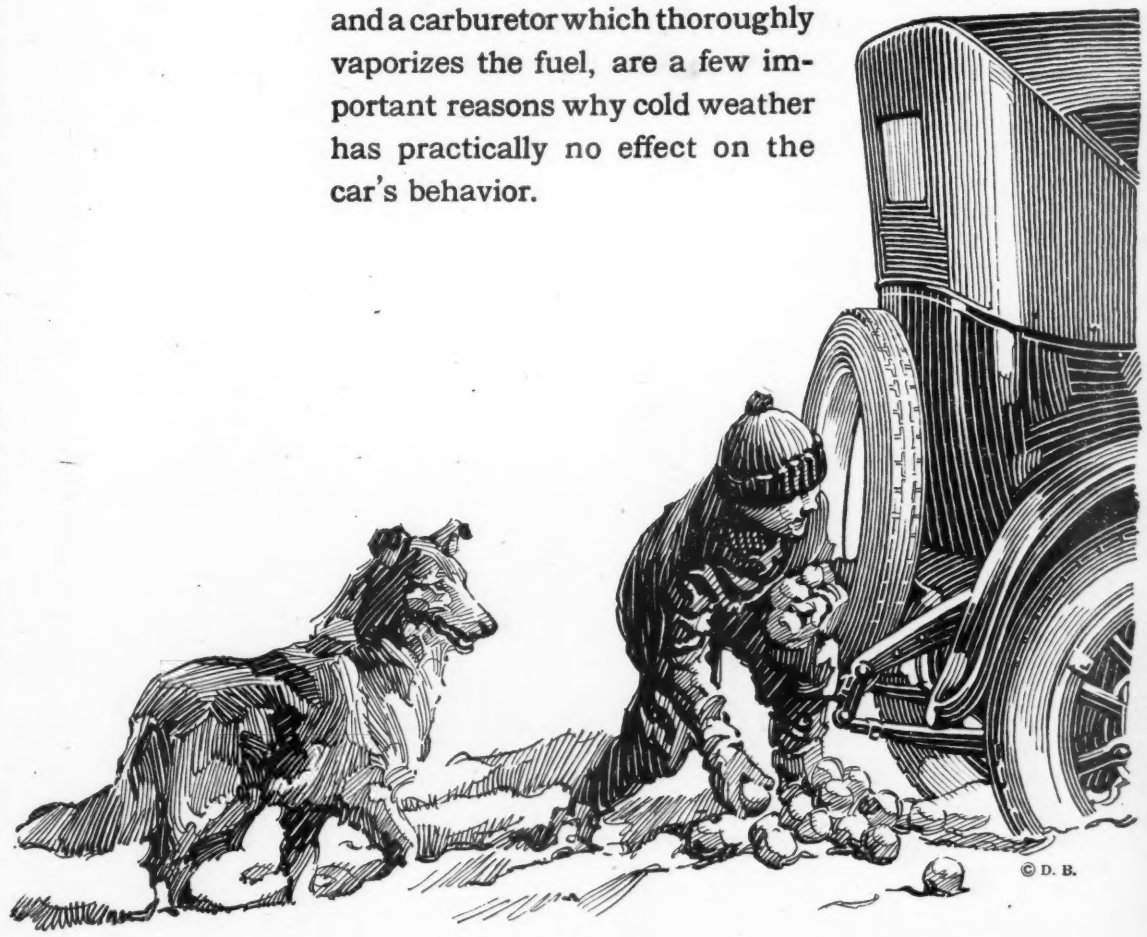
THE ONLY exclusive agricultural broadcasting radio station in the United States is being erected by the Sears-Roebuck Agricultural Foundation on a 130-foot aerial post, which is on top of their nine-story building, located in Chicago. It is planned to have the station ready for operation on or about March first and will broadcast on a wave length of 448 meters. It will be a 500-watt station and will carry a class B license, which is the highest issued by the Government.

Samuel R. Guard, director of the Sears-Roebuck Agricultural Foundation, in giving an idea of what is contemplated, says that it is their plan to broadcast facts that will be of real value to the farmers, so far as the educational phase of the program is concerned. An interpretation of market trends and current event features explaining what is going on in agriculture all over the world will be included in the program, as well as the best orchestral and vocal music to be obtained. Theatrical stars will bring the stage to the farmer's living room and there will also be bed time stories for the kiddies.

DODGE BROTHERS
TOURING CAR

It is good to know that you can park the car on cold days, assured that it will start promptly upon your return.

Precise engine construction, a powerful starter, battery capacity far beyond actual requirements, and a carburetor which thoroughly vaporizes the fuel, are a few important reasons why cold weather has practically no effect on the car's behavior.



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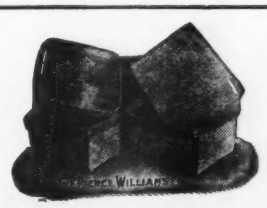

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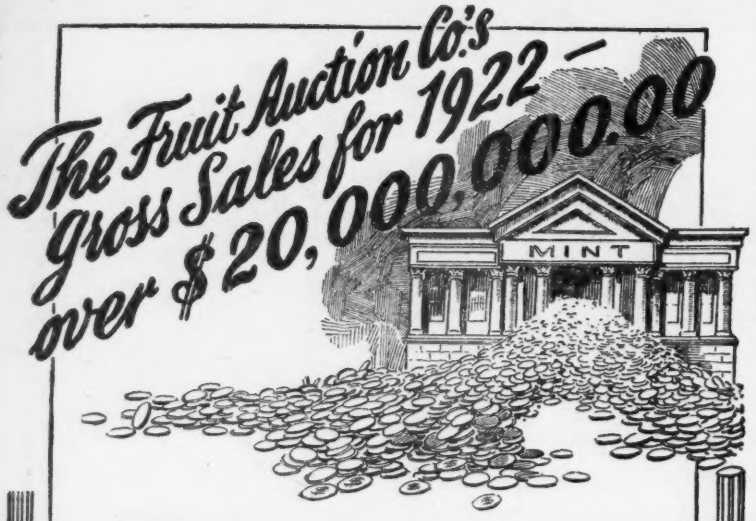

This immense sales volume is important to *fruit* and *vegetable* growers and shippers for two reasons:

First—it shows the stability of our business. A concern that operates on such an enormons scale must be firmly established and therefore reliable.

Second—it shows enormous patronage. To roll up a sales total of this magnitude requires a big customer list. That, in turn, indicates that selling fruits at auction has proven to be the most profitable method, otherwise we could not have induced hundreds of growers and shippers to sell through us year after year.

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And if it is more profitable for *them*, why should it not be more profitable for *you?*

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The Fruit Auction Co.

Established 1896

202-208 Franklin Street, New York City

Coaxing Profits Out of the Farm Orchard

(*Continued from page 26.*)

was to consign the fruit. He did not have to look for markets: they were right at his door. The results of this venture were that the fruit from the farm orchard trees was marketed at remunerative prices.

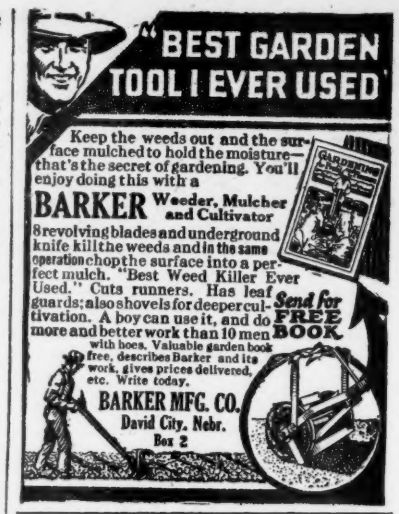
Wisconsin is one of the states which has an apple grading law, and her apple standards are based upon the Federal regulations. A few years ago, the commission houses of Milwaukee almost refused to handle home grown apples because they were so seldom properly graded and packed but this condition is now being overcome. Of course, the farmer members of these spray rings largely sell their apples in open boxes, so that the customer can satisfy himself as to quality; but even these open packages should be properly graded and carefully packed in order to bring the best prices. Poorly packed apples will roll about and become bruised, with a great depreciation in keeping quality.

Program of the Tennessee Horticultural Society

ANNUAL meeting of the Tennessee State Horticultural Society, Nashville, January 30, 1924. Headquarters Hotel Hermitage; meetings in assembly of hotel. Following is the program:

President's Address, S. N. Varnell, Cleveland, Tenn.; Report of Secretary and Treasurer, Prof. G. M. Bentley, Knoxville, Tenn.; Announcements by the Secretary; Address, Commissioner of Agriculture, Homer Hancock; Tennessee's Conditions — Suggestions Leading to Improvement, J. L. Baskin, Field Agent; Selecting Apples for Exhibition, I. C. Murphy, Columbia, Tenn.; Demonstration—Pruning Apple and Peach, Chas. Pennington, Mercer, Tenn.; Apple Blotch Control, Dr. L. R. Hesler, University of Tennessee, Knoxville, Tenn.; What Kentucky State Horticultural Society is Doing, Ben Niles, Secretary, Henderson, Kentucky; Commercial Orchard Advancement in Alabama, Geo. C. Starcher, Opelika, Ala.; Relations Which Should Exist Between the Orchardists and the Nurserymen, Orlando Harrison, Berlin, Maryland; Marketing Early Apples, Nelson Rue, Franklin, Tenn.; Address by Prof. N. D. Peacock, Horticulturist, University of Tennessee, Knoxville, Tenn.; Strawberries, B. A. Craddock, Humboldt, Tenn.; Blackberries, R. R. McUmber, Greenfield, Tenn.; Lucretia Dewberry, E. J. Hoddy, Knoxville, Tenn.; Insect and Plant Disease Control in the Peach Orchard, W. W. McGill, Feld Agent in Horticulture, Lexington, Ky.; Present Status of Packing and Grading, Dr. K. C. Davis, Peabody College, Nashville, Tenn.; The Fertilization of the Peach and Apple Trees, H. H. McKay, Horticulturist, State College of Agriculture, Athens, Ga.; The American Pomological Society, Paul C. Stark, Louisiana, Missouri; Crown Gall, J. A. McClintock, Agricultural Experiment Station, Knoxville, Tenn.; Using Paradichlorobenzene for the Control of the Peach Borer, L. A. Niven, Horticultural Editor of the Progressive Farmer, Memphis, Tennessee; Co-operative Marketing of Strawberries, C. E. Brehm, Agricultural Experiment Station, Knoxville, Tenn.

FAVORABLE growing conditions for grapefruit and orange groves were experienced throughout Florida during the last few weeks. There have been no reports of exceptional dryness in any citrus localities. The cold weather caused no damage to fruit or trees and served to improve the keeping qualities of both oranges and grapefruit, so that the fruit is now shipping better than it did in December or the early part of January. With the continuance of favorable growing weather the fruit should continue to show some increase in size and thereby reduce to some extent the percentage of small sizes.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Write for Prices and Booklets

THE SECOND national co-operative marketing conference of the National Council of Farmers' Co-operative marketing associations was held in Washington, February 7, 8 and 9. At the opening session Secretary Peteet read the following letter from President Coolidge:

"My dear Mr. Peteet: The information which has been brought to my attention by yourself, Judge Bingham, and others, regarding the meeting of the National Council of Co-operating Marketing associations which is to be held in Washington early in February, has been of much interest to me. I have received an invitation to attend one of the sessions and address the conference and am sorry to have to say that my engagements during the days when the conference will be in session are such that it will not be possible for me to attend; and for that reason I am writing to ask if you will express to the conference the assurance of my great interest in the work it is organizing.

"I have many times declared my conviction that the development of a powerful co-operative movement in this country is one of the needs of this period of economic readjustment. Much has been accomplished along this line in many American communities, but it cannot be said that the co-operative idea has found a very firm lodgement in the actual practice of the great majority of the American people. Yet the examples of its advantages, which have been set before us in this and other countries, are so numerous and impressive that one cannot but wish that every encouragement may be extended to such organizations as your own, which are seeking to establish a national co-operative purpose and spirit, especially in regard to agricultural products, when we consider how high a price the consumer pays in proportion to the price the producer receives. We cannot but feel that here is a great opportunity for service to both the consuming and producing groups of the public. We are all included in one or the other of these groups, and most of us in both of them. In the long run we will all be bettered if we can lessen the burdensome costs of conveying our necessaries from the producer to the consumer.

"There is need of co-operative organization among agricultural producers to help them both in selling their products for a better price and buying their requirements more cheaply. There is likewise need for organizations of the urban consumers to give like benefits. The establishment of a close working relationship between these two groups ought to be the ideal to which we strive.

"My understanding is that the program of your own organization contemplates something like this, and I am glad to extend the assurance of my hearty sympathy and my wish to render any assistance possible along such practical lines.

"Most sincerely yours,
(Signed) "CALVIN COOLIDGE."

A MOVEMENT to organize the apple growers of the Northwest was launched at the Pacific Northwest Congress on Apple Marketing held recently at Yakima, Wash., under the auspices of the Washington State Chamber of Commerce. The convention refrained from adopting any plans but authorized the chairman, President N. B. Coffman, of the state chamber of commerce, to appoint a committee of five to constitute an organization committee.

There also grew out of the convention an agreement among the associations of the Northwest to co-ordinate their activities in the marketing of apples.

The committee appointed in a separate meeting to draw up articles of association and perfect the coalition of the various concerns consists of C. H. Swigart of Yakima, manager of the Yakima Fruit Growers' Ass'n, chairman; J. B. Adams of Leavenworth, member of the Skookum Packers' Ass'n; Ed. Pierce of the Spokane Fruit Growers' Ass'n, and R. J. McIsaac, president of the Hood River Apple Growers' Ass'n. The Yakima Horticultural Union, by a vote of its board of directors, decided not to participate in the convention.

Relative to the organization of the fruit growers of the Northwest, there was no definite plan adopted on the floor of the convention, the matter being left to the committee which is to be appointed.

Frederick Read, manager of the standardization department of that exchange, addressed the convention and he was detained on the floor of the convention hall for hours while plied with questions.

The congress was well attended by growers, officials of associations, bankers and business men from the various districts of the Northwest. There were about 40 from the Wenatchee district; 20 from Hood River and adjacent districts, and various other districts in the state of Washington were represented.

Prominent in the convention was a group of Wenatchee business men and growers sponsoring a plan called the "Growers' Co-ordinating Bureau," which provided for an organization among the growers for the maintenance of an executive board and a central office with an executive secretary. It also contained a provision for a shippers' advisory board. All sales and quotations by the shippers were to be reported to the executive secretary and the information to be available to the growers. Each grower would deal individually with the shipper.

THE FIRST peach crop failure scare of this year—and they come annually—is from the Georgia Experiment Station at Griffin. A bulletin issued recently shows that the freeze of January 6 has caused heavy damage of the trees at the station, the damage running as high as 87.5 per cent on late Crawfords.

Oliver I. Snapp, in charge of the government and state laboratory at Fort Valley, however, says that he has failed to discover any serious damage to the trees in middle Georgia.

Griffin had a temperature of four degrees above zero on January 6; Fort Valley's temperature that date was eight degrees. It is the general opinion of growers here that unless there is something to cause damage later on the crop will probably be larger than usual, which probably explains why the growers have begun plans for the marketing of only the best.

THE CRANBERRY market in New York continues dull and poor quality stock has been difficult to move. Fancy late berries ranged during the early part of February all the way from $4 to $9.50 per barrel and half barrel boxes from $3.50 to $4.50. Early Blacks sold generally at $5 to $7.50 per barrel and $3.50 to $3.75 per half barrel box.

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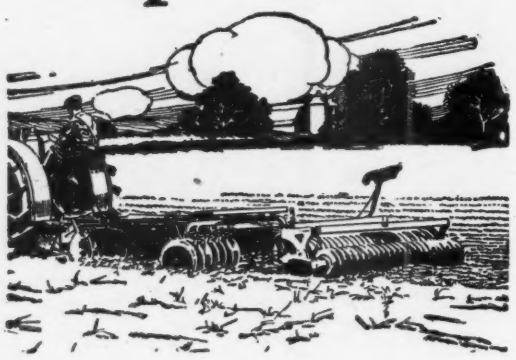
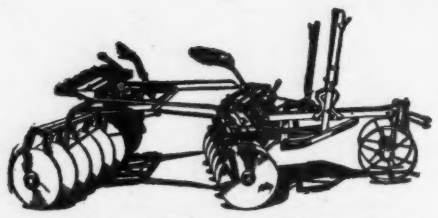
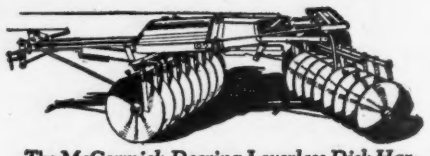
McCormick-Deering Tillage Implements





The *McCormick-Deering Disk Harrow* is a simple and efficient implement, built and trussed like a steel bridge, to serve many years. You will like the details and conveniences—the dust-proof bearings and the bearing oil cups set above the frame, the built-in angle-steel weight boxes, the oscillating disk scrapers, the forecarriage, etc. Made in sizes for everybody—4 to 10 feet. All sizes can be equipped with the tandem attachment which is shown above. Double disking is popular—farmers know that it more than pays for itself.

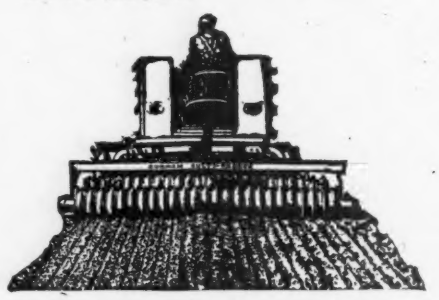


The *McCormick-Deering Leverless Disk Harrow* is a genuine tractor disk, not a made-over horse harrow. It is built for heaviest duty. It is controlled entirely from the driver's seat, without levers, yet it is very simple. Merely backing the tractor automatically sets the angle of both front and rear gangs. When the tractor starts forward the gangs hold that angle until released by a pull on the rope. In 5 to 10-foot sizes to fit your power.

SEED-bed making will call for fast and thorough work this year as always. The planting season will roll around in a twinkling, but no matter how few the days between plowing and planting you can have a profit-building soil by using efficient equipment.

McCormick-Deering Tillage Implements combine the three essentials—good work, long life and convenience. They are of practical design, their construction being based on ninety years of farm and factory experience. They are priced on the basis of economical quantity production, and as an investment they offer you attractive returns.

To Fill All Your Tillage Tool Needs See the McCormick-Deering Dealer. It Pays!



The *Dunham Culti-Packer* has no equal as a seed-bed finisher. It pulverizes the soil, fills out air spaces, and saves moisture content. Following the drill, it helps the little plants to get a quick start, firmly set in finely mulched soil. Use it to prevent winter-killing of wheat; to rejuvenate meadows, etc. It is far ahead of a roller for small grains. Made in eight sizes, for horse and tractor use.

INTERNATIONAL HARVESTER COMPANY
OF AMERICA
(INCORPORATED)
606 So. Michigan Ave. Chicago, Ill.

Present Status of the Olive

(*Continued from page* 25.)

Angeles counties—the warm valleys where water is available—and the more recent plantings that have been made in the Imperial Valley, for olives will thrive in the warm soils and dry atmospheric conditions of the interior valleys where the temperature is reasonably frost-proof, for a "drop" below 28 degrees means injury to the trees.

Irrigation Necessary.

While the olive is in many ways the "camel tree of the desert," owing to its triumphant existence through prolonged periods of drought, expert tabulation has shown that experiences such as these result in commercial groves in acute financial loss, for the olive is as dependent upon water as any other plant or growing tree, making soil moisture, either natural or supplied, an actual necessity. Fully 85 per cent of the groves in California are now under irrigation and the improvement in size, productivity and quality is in gratifying contrast to the non-irrigated groves.

Black scale is prone to attack olive trees planted in the coastal valleys, and districts that are swept by high winds also prove unsuited to olive culture, for both blossoms and fruit are whipped from the trees and, should a chill wind come when the fruit is reaching maturity, this menace sends the sap scurrying to the roots of the trees, leaving the fruit shriveled and shrunken upon the branches.

It is true that with the return of normal weather the sap again ascends, flowing with quickening urge into the tips of the tiniest twigs and restoring such fruit that remains upon the tree to its natural appearance, but conditions such as this invariably delay the harvesting process for days, indeed this "waiting" may even stretch into weeks, thereby increasing the expense of harvesting and lessening the crop to an appalling degree.

Propagation.

Olive trees may be propagated from seeds and cuttings or by budding and grafting. As seedlings produce variable strains they are used principally for stocks upon which to bud or graft dependable types. Cuttings produce a quick and satisfactory growth, require less skill in setting and are the approved method of starting new groves, and there is also the added advantage that cuttings can be made at any time, for the condition of their growth is the determining factor in their selection.

Cuttings can be taken from branch tips or from hardwood, whichever is available. Tip cuttings are taken from twigs that have completed their length growth and cuts about 4 in. long are taken from the firm, but not hard, wood. Their preparation is similar to that of other plants for the cut is made below a node, the two lower leaves are pulled off and the remaining leaves are cut back to half their length. They are placed closely together in a sand bed until the roots develop, which generally occurs in a few weeks, then they are transplanted to other beds until ready for commercial planting.

Hardwood cuttings are made from branches that are from three-fourths to an inch and a half in diameter and from 14 to 16 in. in length. They are usually cut in January or February, when the wood is dormant, and are tied in bundles and trenched in moist soil until spring, when they are set in nursery rows, placing them from 10 to 12 in. deep and leaving only a couple of buds projecting over the surface of the soil. They root readily and the sprouts that shoot up are allowed to grow until the end of the first season, when the one showing the most sturdy and desirable growth is chosen for the development of the new tree.

Grafting and budding may be practised at almost any season of the year although the cutting back of branches is most frequently done in winter and the grafting is completed early the following spring. As the olive tree is

(*Concluded on page* 50.)

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THE CENTRAL TRACTOR CO.
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The Orchard Home Department

by Mary Lee Adams

Feed the School Child Well

THE YEAR is growing late from the school child's point of view. Lessons lag as interest lessens and it becomes a problem for parents and teachers how mental and physical efficiency may be kept at top notch until vacation.

There's no hope of accomplishing this unless the children have proper food. Surveys of school children show that malnourished children are incapable of doing well at their books. They also show a very surprising extent of malnutrition among school children. And it isn't so much that the children don't get enough to eat as that the food does not contain the proper nourishing elements. Children of the rich are just as often malnourished as those of the poor.

The school lunch grows awfully monotonous after months of opening packages of cold food. Ingenuity is required to keep these lunches appetizing and varied. The child who has eaten an indigestible lunch, or none at all because he is so sick of the same old thing, cannot do good work in the afternoon.

Mothers must consider food values for both house and school menus. Once more it is well to remember what things are essential to the health of the child. Milk stands pre-eminent, and small children especially should drink much of it. Eggs, too, are chock-full of wholesome nourishment. The hens will be more obliging from now on.

In addition, the daily diet should by all means have some green leafy vegetable and some fruit. Difficult in winter you say. But what about cabbage? Wholesome as can be. The king of winter vegetables. As for fruits, oranges and apples are in season. Bananas make a nice variety and raisins are a very desirable sweet. Much more so than candy.

From your pantry shelves should be taken many a can of summer fruits, and berries, glasses of jelly and jars of jam. Can't you arrange so that the children in your community shall have one hot dish for lunch on these cold days?

The Romance of America

FOR A long period, centuries in fact, when we wished to delight our eyes with wonderful scenery, it was the accepted thing to go abroad. Without a thought for America, we went to Europe. We still go, and there find endless beauty and interest, and seemingly endless trouble.

But it is all right now, indeed commendable, to see America first. There is nothing finer anywhere. What belongs to us, our scenery, our own history, our own romance, begin to command our liveliest interest. No surer sign of this can be found than in what is being presented to us at the movies.

One of the first stupendous reel pictures showed the catastrophe that befell the ancient cities of Herculaneum and Pompeii through an eruption of Vesuvius. Since then we have witnessed historical romances of Egypt, of England, of France, etc., but now America forges to the front and holds first place on the screen.

"The Covered Wagon" has created unparalleled enthusiasm. Here is something to which we are akin. Those pioneers might have been our own grandfathers. Those young girls may have become the mothers of men we know. Some, whose ancestors really went west by wagon train, sit with streaming eyes as they watch the hardships that overtook those dauntless souls. The courage and persistance with which every danger and obstacle were met, still form the warp and woof that go into the weaving of the very finest American material today.

The movie star, Charles Ray, announces his ambition to feature American romance. He believes it will appeal to our people and he knows it will be good for them to see with their own eyes the reproduction of those stirring early times. So we have the "Courting of Myles Standish," from which many of us will come away with added respect for our Puritan ancestors and with several new bits of knowledge about the history of those times. If producers keep up the high standard of these plays, they may rely upon the support of the public. A splendid movement is under way.

Why Men Should Marry

SINCE many orchard women are married, it will interest them, agreeably or painfully as the case may be, to know that their husbands have a better chance of long life than had they remained single. I never much liked the ancient jest that it was not true married men lived longer, it just seemed longer. But, Madam, it is true that longer life is the reward of the married man.

Had you refused Henry your hand, you would be responsible not only for a broken heart but for a shorter life, and possibly for a criminal or insane one. This, of course, if Henry had not assured himself of the best chance for longevity and good conduct by wedding another.

Prof. Wm. F. Ogburn, of Columbia University, has arrived by scientific investigation (to which dread process each individual, be he man, monkey or mollusc, is subject) at the sound conclusion that married men, en masse enjoy longer lives, less filled with crime and insanity, than their bachelor brothers.

Call Henry's attention to this fact. It will be sure to please.

Pay Day Comes Too Often

PAY DAY, not the day you get paid but the day you pay someone else, comes around far too often for those who buy on the installment plan. And who does not so buy? The National Association of Retail Clothiers and Furnishers declare that we are "payment mad."

It appears that we go into debt chiefly for automobiles and musical instruments. Maybe some of you who read this are already getting nervous about the sum due on your new victrola or closed car. Radio, also, while enlivening the present, darkens the future of thousands.

We build, furnish our houses, wash our clothes electrically, drive, play, wear our fur coats, long before we pay for the indulgence. It is declared that a majority of wage earners have mortgaged their income for years ahead. So, gentle reader, if perchance you are "installed" in this dubious luxury of possessions, you at least have the comfort of companionship. But is the game worth the candle?

Silk Worms Must Be Busy

WHEN as a child you rummaged among the old trunks in the garret, you were pretty sure to find a faded old silk dress carefully laid away. If you begged to put it on to play grown-up in, Mother would say that it was Grandmother's silk dress and she would hate to have it spoiled, that it was a keepsake.

Fancy a silk dress being kept that way now. The first day of 1924 saw four trains rolling across the continent from Seattle, loaded with silk from the Orient and bound for New York. Four special trains; 46 baggage cars; 100 armed guards; $12,000,000 worth of silk! Some rustle to that.

Every one of us may hope for a new silk dress this year. It suggests the idea that the time may come when a silk dress will cost less than cotton. Oh happy day! But maybe we won't care so much for it then.

Farm Woman's Best Friend

MUCH has been said about the devotion of dogs to their masters. I ask my women readers—if they are the fortunate owners of dogs—whether this should not include their mistresses also. In olden times, when the dog was far from being the completely domesticated animal of today, his wolfish form accompanied his shaggy master on the chase, leaving the woman at home to execute the tasks of her primitive housekeeping. Some of these tasks, such as skinning wild beasts and dressing their hides, would nowadays scarcely be considered woman's work.

When the sole gainful occupation of men was to hunt meat for the family, the woman sowed and reaped. As civilization advanced, man became less a creature of the forests and the chase and more a tiller of the soil. Woman was not so much afield. The dog, no longer essential to man's daily toil, took on the traits that mark him today. Remaining the friend and companion of man, he became also the guardian of the homekeeping woman and children.

On how many farms throughout the country women owe their sense of security to the faithful dog, for dogs, the descendants of wolves, are feared as well as loved. Midnight marauder or trespasser by day, heeds the warning, "Beware of the dog."

A little woman of my acquaintance, who owns and operates a large plantation in a certain section of the south, where, on account of the character of the surrounding population, conditions are none of the safest, has for many years lived on her property entirely alone save for two great dogs. They love their mistress and their first duty in life is to attack anyone who would harm her. In her lonely existence she feels entirely secure.

Children Love Dogs.

On the farm where there are children, what would they do without the playfellow who resents no childish prank and is ever ready to share in their sports? When the mother's duties call her away from the baby's cradle, she relegates her responsibility to the dog. He may often be seen guarding the kittie-coop where in summertime baby sleeps under the shade of lawn trees.

I think that the forbearing tenderness dogs show for little children arises from the fact that during their puppyhood they have been so like children themselves. If you doubt this, give yourself the pleasure of raising a pair of puppies and watch their antics and gambols.

Not only are their plays much the same as children's but their very wiles and winning ways remind us irresistibly of the child who, unconsciously, relies upon his potent charm to disarm reproof. Child and dog go through the same stages of development up to that point where poor Bowwow ceases to advance while the child keeps on growing mentally and physically.

Like Child Like Dog.

First there's the rather trying period when everything goes into the wee one's mouth, be he pup or babe. Where a puppy dwells, no glove or shoe may be carelessly dropped without the almost certainty of finding its way between those sharp little teeth. As one embarrassed mistress said, she had no idea there were so many disreputable objects about her house and grounds until the puppy began to drag them out—preferably when company was present.

Compare the expression of a child who has been told to lie down and go to sleep, with that of a pup stretched at full length, feigning slumber in every line save that the bright little eyes silently follow your smallest movement. Compare also the generous lack of resentment shown by dogs with that same most endearing trait of young childhood. Neglect the dog, scold him or punish him, and at the first sign of relenting the creature that bears no malice is all loving demonstration.

From the age of popping everything into their mouths, child and dog progress to the stage of romping games. No group-up can watch without envious amusement the antics of either. How they tear about playing tag, children by means of grabbing at each others' clothes, pups by catching hold of the leader's tail. Hide and seek they play and indulge in infant wrestling matches.

Then, after exercising every muscle, dog or child will fling himself prone for a few panting seconds and bound up again thoroughly refreshed and rested for the next mad frolic. The happy shouts of children are reproduced in the joyous barks of puppies. Play, play, play all day long is the end and aim of their existence.

Little Boy Dogs Quarrel.

Then comes a time when the puppy goes through the last stage of dog-boydom and enters upon his life as a dog by the same gate through which little lads often pass before reaching young manhood. Boy or dog gets quarrelsome. Or is it really not so much quarrelsomeness as a desire to test his strength and a delight in overcoming his opponent?

Be that as it may, two pups, after they have rolled and romped in perfect amity for months, will some day draw back their lips over alarming looking teeth, snarl hideously and fall upon each other. After that, their encounters, though not deadly and leaving no rancor behind, are amazingly frequent and, so far as the observer can see, amazingly unprovoked.

High Up in the Scale.

Out of this stage of hobble-de-hoydom, the puppy emerges as the faithful, sturdy, reliable dog. A little lower than man, it is true, but far more intelligent than most other animals and gifted beyond any four-footed beast with a well-developed conscience and many most admirable virtues.

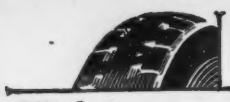
Personally, I'd far rather rely upon a dog for my defense than upon a revolver. He'd be much less apt to turn and rend me than the ill-aimed firearm. If one felt no hesitation about shooting, the watch dog would still be invaluable as an alarm. Even as I write, my eye falls upon a newspaper headline, DOG WARNS OF FIRE, and I read the true story of a mongrel pup whose barking aroused a man sleeping on the top floor of a four story building when fire broke out in his apartment. Nor was this the sum total to the mongrel's credit. Just two weeks before he had discovered a deserted baby in the hallway and barked until the aid thus summoned arrived and the infant was saved from death by starvation or exposure.

Much as most of us love dogs, we do not give them all the credit they deserve. Have you ever thought of your dog as a business asset? Yet he has been declared such by the United States Fidelity and Guaranty Co. They extol the dog as the "original and in some respects the most reliable burglar alarm." In accordance with their "merit rating" plan, there will be a reduction of from five to ten per cent on insurance issued by this company against "burglary, larceny and theft" to those who keep a dog on the premises.

Thus another honor has rewarded this faithful guardian and he has taken his place along with youth, health and asbestos shingles as offering reasonable grounds for low insurance rates.

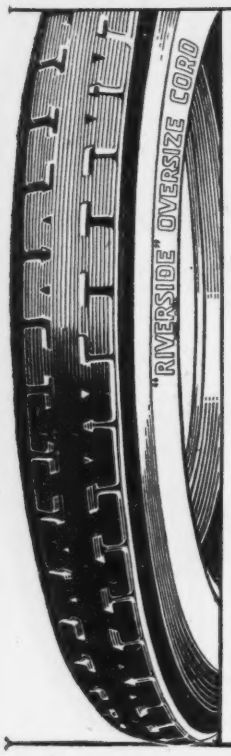
IF soot or any similar matter, drops on your carpet do not rub it. Cover thickly with dry salt. Then carefully sweep it up. The soot will come up with the salt and will not stain the carpet.

XUM



10,000 miles guaranteed and yet you save ⅓

Riverside Oversize Cord Tires



Riverside Oversize Cord Tires are guaranteed for 10,000 miles and in actual performance give up to 18,000 miles. Can any other tire do more?

So why not save one-third and use Riverside Cords? What more will any other tire do? Then why pay more?

And this 10,000 miles service is backed by a guarantee that has stood for fifty-one years. Does any other tire carry a better guarantee?

Quality is built into Riverside Cords

This guaranteed mileage is built into Ward's Riverside Cords. High treads, thicker and stronger, of tough, live rubber.

This exceptional quality of Ward's tires alone has made us the *largest retailers of tires in the country*. The tires themselves have convinced thousands that Riverside Cords are best.

"I have used Riverside Tires for the past four years. I have never had to send a tire back for adjustment. I have tried several different highly advertised makes alongside of Riversides and have not found a superior."
Walter M. Schworm, Nessen City, Mich.

You Don't Risk One Cent

Before you buy any tires send for Riversides. Inspect them. Compare them with tires selling for $5.00 or $15.00 more.

Send them back if you do not find them the equal of any first-quality oversize cord made. We will refund your money.

These prices buy 10,000 miles of service—and more.

CATALOGUE No. 464M00—Be sure to give size.

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32 x 4	16.95	42c	34 x 4½	21.95	48c
33 x 4	17.45	43c	33 x 5	28.75	58c
34 x 4	18.25	43c	35 x 5	29.95	61c

"I have used two Riverside Cords on the rear wheels of my car for two years. They have gone over 12,000 miles now and have never been off the wheels — and they still look fine."
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Assorted, all breeds mixed	5.50	10.00	47.50	90

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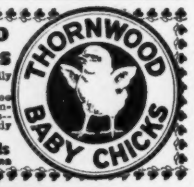

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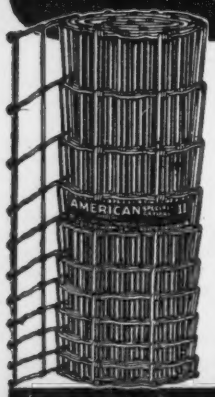

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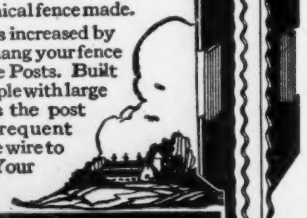
Better construction, better galvanizing, full gauge, full weight and full length rolls—American Fence is the most serviceable and the most economical fence made.

As the life of good fence is increased by the quality of its posts, hang your fence on Arrow Tee Steel Fence Posts. Built on the railroad rail principle with large anchor plate which locks the post firmly in the ground. Frequent notches permit every line wire to be attached, if desired. Your dealer can supply you.



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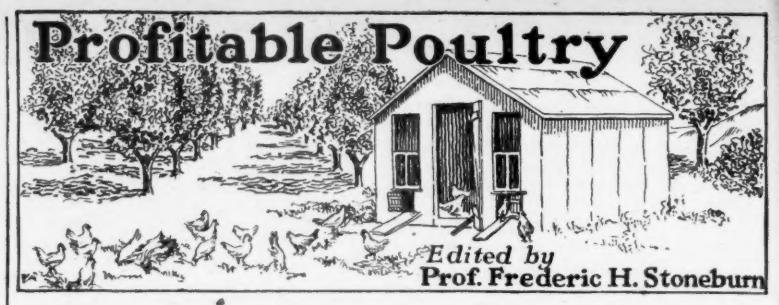

Brooding Chicks in Large Flocks

FOR MASS-PRODUCTION of poultry, as previously stated in these columns, the most popular and satisfactory equipment is the modern stove or colony brooder, which cares for from 250 to as many as 1000 chicks in one flock. And the best place in which to operate a machine of this kind is a roomy two-pen house, one compartment containing the brooder, and so kept comfortably warm at all times, and the other a cool room to which the chicks may move when they feel so inclined.

These machines are equipped with automatic regulators which control the drafts in such a manner as to keep the temperature fairly constant at a point near the brooder. Slight variations in temperature do not greatly matter. Keep a zone immediately about the machine warm enough to afford comfort to the smallest and weakest member of the flock and the rest will find the temperature which best suits them by moving toward or away from the source of heat.

The poultry grower should set up and operate the machine for a few days before the chicks are expected, so he may learn what it will do and exactly how to manage it. This trial trip will often prevent loss which might occur if the machine had not been heated up until the arrival of the chicks. If there are defects, these can be located and corrected without loss of valuable chicks. And the beginner especially should learn, through practical experience, how best to manage the fire and adjust the regulator.

When the chicks arrive one should take all necessary steps to so manage them as to avoid loss from troubles which may be foreseen. Of these, overcrowding is perhaps the worst. When chicks are brooded in large flocks, there is often much loss caused by rushing and crowding, the weaker being injured by the stronger. Large broods often develop a tendency to "pile up," for apparently no good reason, which means death or injury to many.

This is most frequently observed at night and on unpleasant, chilly days. The greatest damage is done when the piles occur in the corners of the building, as those unfortunate enough to be next to the walls are pushed into the corner and cannot escape. This may be avoided, to a certain extent, by placing boards or netting across the corners, or filling these up with heaps of straw or planer shavings. Real safety lies in carefully watching the broods until they get their habits fairly well fixed, especially when they are settling for the night. Break up any piles which are forming and drive the chicks toward the brooder. This is most easily done by using a large, soft broom and gently sweeping the stragglers in the desired direction.

Mobs will also form about the feed hoppers and water dishes. The small will be bullied by the strong, trampled and prevented from securing the feed they need, a double injury. The solution lies in providing enough of the containers to permit all chicks to comfortably lay in the required supplies.

Narrow doors are also a constant source of danger. Let the chick doors be at least two feet wide so when the flock rushes in a body from room to room or out of or into the house, no chicks will be jammed against the sides. At feeding time, or when an alarm is sounded, there is always a rush and if the free movement is checked, some individuals will surely get hurt.

Some covering, or litter, must be used on the floor of the brooder house. Dry earth, planer shavings, chaff or cut straw are all suitable after the chicks are a few days old and have learned what they may eat and what they should leave alone. For the first few days fine dry earth, or even bran, is best. When coarse sand is used, many chicks will often gorge themselves with this and then their death is a matter of course. They may also swallow particles of chaff or shavings, which will also cause considerable loss. After the brood has started eating the regular rations, such materials can safely be used as litter.

Temporary low partitions of boards or fine wire netting should be erected about the brooder, at a distance of a few feet, to keep the chicks near the heat for the first few days after they are put under the machine. Within a few days, however, they will learn where comfort lies, then the barrier may be removed and the family given the run of the room. Soon thereafter they may be permitted to go out into the cool compartment, and then out of doors.

Make it a point to get the youngsters out on the ground at an early age. Confinement in close quarters often brings on bad habits, as cannibalism and toe-picking. Freedom to run at large and contact with Mother Earth seem necessary to maintain health and vitality.

When the chicks are first let out-of-doors, give them only a small yard in front of the house. Soon the fence may be removed and the youngsters permitted to wander at will. The greater the amount of range the better the stock will be at maturity.

Keep the brooder house clean. Renew the floor covering at frequent intervals. Use disinfectants regularly and freely. Keep everything in sanitary condition and prevent disease from securing a foothold in the flock.

Watch the ventilation. "Continuous comfort" should be the watchword. Do not permit a draft across the floor under the hover. If this occurs the chicks will be most uncomfortable, cool on one side and warm on the other. Do not let the house become uncomfortably cool or oppressively hot. Overheating is more common than chilling.

Close up the houses at sundown to repel night-prowling enemies, and prevent the brood from rushing out at daybreak when conditions may be unfavorable or hawks patiently awaiting for their breakfasts. But do give the future profit-earners attention soon after daylight, when they are sure to be hungry and restless. If one is to grow big flocks of good chicks he must put in long hours during the critical period of brooding.

Feed with care, study the problem and use intelligence. Set rules are of little value, save as they indicate the general line of action. Meet the conditions as they arise from day to day. A poor or careless feeder will ruin any flock.

It is my sincere belief that it is true economy to use ready-mixed commercial chick feeds rather than home-mixed rations. Space limitations prevent a discussion of this complicated question and I must content myself with merely expressing my personal opinion. If one wishes to prepare the

required feeds, the following mixtures will be found satisfactory.

Scratch Feed—10 pounds each fine cracked corn (yellow corn preferred), cracked wheat, pinhead oatmeal or steel-cut oats.

Chick Mash—30 pounds wheat bran, 10 pounds each wheat middlings, ground hulled oats, oil meal, corn meal, gluten feed, fine meat scrap and dried buttermilk. All ingredients should be sweet and of good quality, and the whole thoroughly mixed.

Milk in some form—fluid, semi-solid or dried—is an ideal food for baby chicks as it is for other babies, in fact, it is almost a necessity.

Bone-building material is also important and frequently overlooked. Use some bone meal in the mash or keep fine cracked bone available so the chicks may help themselves. Supply fine grit in hoppers or scatter it on the floor occasionally.

Give tender green food every day, as lettuce, sprouted oats, tender grass or clover. After the youngsters are out on range, they will usually find the greens they need, but if abundant green growth is not available, provide the "salad course" regularly.

Keep water or fluid milk before the flock all the time. Do not permit the fountains to become empty. If the weather is cold, take the chill off the drinks and keep the fountains near the brooder.

Do not feed too early. Let the babies reach the age of at least two, better three, days before they are given their first meal. This allows them time to absorb the large amount of egg yolk present in their abdomens when they are hatched.

Use the mash exclusively for the first two or three days after the chicks begin to eat. Spread some of the mixture on boards or in shallow dishes or chick feeders and attract attention by tapping in the food with the finger. Some of the hungry babies will soon begin to pick up particles and the rest will quickly learn the trick.

For the period mentioned above, feed the mash at intervals of three hours, removing the feeders after 30 minutes. Provide room at table for the whole family. "Little and often" is the program at the start. Presently the feeders may be kept before the brood all the time and each individual permitted to eat as his appetite dictates. There will be little danger of over-eating of this dry, ground mixture, especially after the brood has the run of the two rooms or gets out-of-doors. Liberal feeding is necessary to induce the desired rapid growth. I never saved any money by attempting to save feed.

If for any reason it seems best to use moist mash, the dry mixture should be dampened with water or milk and a full meal given three times daily. Under such conditions the dry mash should not be given.

By all means use mash hoppers or feeders which are so built as to prevent their contents from becoming contaminated with droppings. If such fouling occurs, the entire flock may be attacked by bowel troubles.

After the brood learns to eat mash, begin giving the scratch mixture. Avoid too liberal feeding of these mixed grains. Give enough to provide variety and induce exercise, the latter by scattering the kernels broadcast in the litter. Examine a few chicks just before dark, and if their crops are not full, give them a good feeding of the grains which they love and with which they will quickly fill their little bread-baskets and so have supplies to carry them through the long hours of darkness.

Rapid growth, however, is the result of heavy consumption of the body-building mash, which not only supplies the required materials but also in the form which assists rapid digestion.

Good chicks—good brooders in good houses—good feed—good care. This is the formula for the production of good fowls. And one cannot afford to bother with any other kind.

The Best Methods of Fruit Growing Pay on Home Farm

by F. L. Clark

SEPTEMBER 18 last year was "Grape Day" at Strawberry Point, Ia., just as some mid-September day every year has been "Grape Day" there for a long time. The center of activities was on the Charles H. True fruit farm. Mr. True has 3 acres of the choicest, finest grapes in the country, growing alongside his 4 acres of beautiful apple orchard. Fruits of orchard and vineyard carry off many prizes at the Iowa State Fairs.

Local Market.

There is a market locally, Mr. True has found, for all the fruit he can raise and he does practically no shipping. Neighboring towns within a radius for about 20 miles eagerly compete for his fruit. In marketing his grape crop he uses a novel method. The early varieties he picks and sells by the basket at fancy prices. Then he announces he will hold a "grape sale" on a certain day. The sales have become a community event which nobody wants to miss. No advertising other than the announcement of the date is necessary to set the whole countryside flivvering to the True farm.

Buyers bring their baskets, shears and knives and are allowed to pick all they want at so much a pound as long as they last. Last fall before 6 o'clock in the morning of the sale, 110 cars were parked in and around the True farm. Those who came after 7 o'clock had to go away with empty baskets.

During the hour of picking, several men at tables on the lawn weigh the grapes and gather in the money, while other men are busy parking the automobiles. From 700 to 10,000 lbs. of grapes are sold usually. The price last year was 4 cents a pound. "People tell me," said Mr. True, "that I could just as well have gotten 5 or 6 cents a pound, but I am not trying to get rich. All I want is a fair profit. I've got folks trained and they're careful. All I insist on is that they pick clean as they go—ripe, green and all."

Mr. True is 76 years old and does practically all the work on his fruit farm, having help only about half the time in the summer and fall. He began developing his present orchard and vineyard 45 years ago. While fruit growing generally has been having pretty rough sledding in northeastern Iowa, Mr. True has been putting into practice on his $200 an acre Iowa land the same kind of fruit culture which thousands from Iowa and other Corn Belt states have expatriated themselves to put into practice on the Pacific Coast or in Colorado. He prunes and sprays and cultivates just as the western growers do. He grows the best commercial varieties only and those which he has found do best under Iowa conditions. The soil and climate of the native home of the wild apple and the wild grape have responded to the square deal he has given his trees and vines. That's the whole secret of his prize fruit, he says, and the reason why his vicinity does not have to depend upon imported fruits to get perfect, keeping ones.

Fruit Source of Income.

Though Mr. True has 8 acres of pasture and plow land, and keeps a team and a couple of cows, fruit is practically his whole source of income and has been for many a year. The comfortable dwelling with its beautful lawn and private driveway between pines and hedge suggest the prosperity that has come to the owner by just growing fruit, while everybody else in his part of the state has been raising corn, barley, timothy, clover, hogs and cattle. His 7 acres have brought to him a living which most farmers think it requires a quarter of section of Iowa land to give.

"Do you think your orchard is more favorably located than other orchards of northeastern Iowa which have died out?" Mr. True was asked.

(*Concluded on page* 46.)

"Barrett Shingles on the house, Barrett Roll Roofing on the barn—those roofs are off my mind."

There's One Right Way to Buy Roofing—

On a Cost-per-Year-of-Service Basis

With Spring just over the hill, you'll soon be out in the fields. This is the time, then, to get your buildings fixed up. And roofs come first. This time why not put on roofs that will last? Get this matter of roofs off your mind—put on Barrett Roofings. Here are roofs that last for good "horse-sense" reasons.

Start at the felt base of Barrett Roll Roofing—the factor on which the weather-tightness and permanence of a roof largely depend. Barrett Felt has been the standard of quality for 66 years. This thick, tough felt—every fibre of it—is saturated with the highest grade waterproofing material. Then, as an added protection, this base is covered on both sides with a seal-coat—a special blend of this same water-proofing material.

Finally, to make certain that Barrett Roll Roofing is absolutely weathertight, every roll, during the process of manufacture, must undergo 70 inspections before it leaves a Barrett factory.

Free Booklets that Give Interesting Facts About Roofings: Send us your address and we will mail you, absolutely free, a series of booklets that give valuable facts about our different types of roofing. These books also describe other products of great money-saving value. Drop us a postal card or a brief letter—today!

Your Choice of Six Styles

Everlastic Smooth-Surfaced Roofing

The most popular of plain-surfaced roll roofings. Made of best grade roofing-felt, thoroughly saturated with high-grade waterproofing material. Under surface is protected by rot-proof seal-back. Tough, pliable, elastic, durable, and low in price. Easy to lay. Nails and cement in each roll.

Everlastic Mineral-Surfaced Roofing

A beautiful and enduring roll roofing. Mineral-surfaced in red, green, or blue-black. Has rot-proof seal-back. Nails and cement in each roll. Very popular for bungalows, cottages, garages, and all farm buildings.

Everlastic Giant Shingles

These "Giants" for wear and service are handsome enough for the expensive home, economical enough for small farm house or cottage. Their weather side is mineral-surfaced in beautiful shades of red, green, or blue-black. This fadeless mineral surface resists fire and never needs painting. Their base is extra heavy roofing-felt thoroughly waterproof. Because of this extra-thick, extra-rigid base, these shingles can be laid right over the old roof—a big saving on reroofing jobs. Size 8x12¾ inches. Are laid easily and without waste.

Everlastic Single Shingles

Mineral-surfaced in red, green, or blue-black. Base of best grade roofing-felt. These shingle are staunchly weather-proof, fireresisting and need no painting. Size 8x12¾ inches.

Everlastic Multi-Shingles

Four shingles to a strip. Mineral-surfaced in red, green, or blue-black. Two sizes—10 inches and 12½ inches deep, both 32 inches long. The 12½-inch Multi-Shingle, laid 4 inches to the weather, gives three-ply roof — the 10-inch gives two-ply roof.

Everlastic Octagonal Strip Shingles

The latest in strip shingles. Mineral-surfaced in red, green, or blue-black. Afford novel designs by interchanging red strips with green, or red strips with blue-black.

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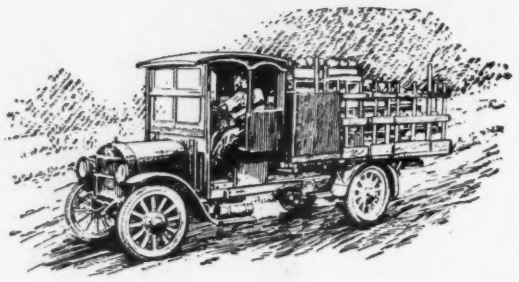

Haul Right From the Orchard With a GMC Truck

You can haul your crop right out of the orchard with a GMC—regardless of the ground conditions—provided there is sufficient traction for the wheels to get a grip.

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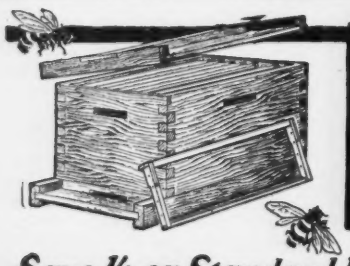

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These hives are typical of Ward's Bee-Keepers' Supplies—low-priced but standard, serviceable supplies of every kind. We sell pure bred Italian Bees and Queens. Send for our General Catalogue No. 100 which shows our complete line of hives, sections, foundation, smokers, honey extractors, feeders—in fact, everything for amateur or professional bee keepers. Write to Dept.—B-3.

Ward's is headquarters for bee keepers' supplies.

MONTGOMERY WARD & CO.
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Write for General Catalogue showing all standard Supplies for Bee Keepers at lowest prices.

Making a Start With Bees

by H. F. Wilson

IF YOU are planning to start with bees this spring, let me advise you to investigate thoroughly before doing so. First of all, write your Agricultural Experiment Station for information and bulletins. Then secure a good book on beekeeping and subscribe for a beekeepers' magazine, either the American Bee Journal, published at Hamilton, Ill., or Gleanings in Bee Culture, published at Medina, O. And, finally, before the bees arrive, see if you cannot visit the yard of some beekeeper and solicit his aid.

It is a very simple matter to acquire a colony or two of bees and start in with the idea of getting lots of honey. Thousands of persons make such a start each year but comparatively few of these continue with the bees for more than two or three years. What at first promises to be a lot of fun with a profit at the same time, soon proves to be a real piece of work with the fun knocked out by the disagreeable features which are a necessary part of beekeeping as well as of other pursuits. Beekeeping is not a difficult task but in order to secure maximum returns, every manipulation necessary for success must be carried out at the proper time in the season. Now if you are determined to have a few bees and are sure that you will continue to "love and cherish them," continue as follows:

Before buying any bees or second-hand equipment, fix this fact firmly in mind. Bees, like other animals and people, are attacked by disease, and one disease in particular will completely destroy a colony in one season if proper treatment is not provided. This treatment consists of destroying all the young bees and the combs and starting the bees on new foundation. It is more or less distributed throughout the United States, so you should consult your state bee inspector as to the chance of success in your locality before making the start. Also, do not buy any bees or second-hand bee equipment without determining from the state inspector as to whether or not the dealer has an inspector's permit to sell bees or second-hand equipment. Disease germs may be carried over in old combs or hives as well as with the bees and the beginner is taking too great a risk in using such equipment unless passed upon by a competent inspector.

How and When to Make the Start.

Under all circumstances, the beginning beekeeper should make his start at a time in the year when some mistake on his part will not result in a total loss of colony or a season's crop. Secure your bees in early May, and under no circumstances later than June first unless someone gives you a colony or a swarm. In most sections of the country the honey flow will be over by July 15 and colonies started later than that date may have to be fed sugar syrup to carry them over the winter.

If you can buy a colony of bees from a reliable neighbor whose bees are healthy, that will be the easiest plan. If this cannot be done, then write to your apiary inspector and get the name of a reliable dealer in one of the southern states. A full colony can be bought for $15 to $20 and parts of colonies under the name of neuclei or package bees can be bought for six or seven dollars each. A full colony of bees should contain 10 combs in movable frames and about 50,000 bees. A neuclei consists of one to three combs with from 5000 to 10,000 bees, including a queen. "Package bees" come without combs and are sold by the pound. The buyer can secure one, two or three-pound packages with a queen, which is usually priced extra.

A full colony of bees needs only to be set out when it arrives and extra hive bodies added when the honey flow starts. Additional frames with foundation must be provided for neuclei and package bees. Do not buy neuclei of less than three frames, and package bees of less than three pounds. Be sure that your order includes a queen. Before the bees come, order the equipment necessary for as many colonies as you desire. Extracted honey is more easily produced by the beginner than comb honey, but unless you can borrow an extractor and uncapping knife from a neighbor, you will find it desirable to start with comb honey. For each colony, you should have one full depth super with frames and foundation and two or three comb honey supers. It is advisable not to start with less than two colonies nor with more than five. In starting with two colonies one can build up again should something happen to one of them and in case more than two colonies are desired, more colonies can be formed from the two by dividing them after the surplus crop is secured.

Care of Bees in the Spring.

If full size colonies are secured they usually have sufficient stores to keep them going and extra stores are not necessary. But if neuclei or package bees are bought, it will be necessary to feed them sugar syrup as soon as they arrive. About 10 to 15 pounds of syrup will be needed by each neuclei or package. Make up the syrup by adding equal parts of sugar and water by weight and heat until the sugar is completely dissolved. No special apparatus is needed. Secure a friction top syrup or honey pail, punch a few tiny holes in the top, fill with syrup and invert on top of the frames with a hole in the center just large enough to permit the feeder to set next the frames. Then put the extra empty hive body or super on the hive and set the cover on top. Examine the feeder every few days and when empty fill and set on again unless there is an abundance of flowers of some kind in bloom. As soon as the bees are securing nectar from the field the feeders can be removed.

To Prevent Swarming.

One of the principal difficulties which the beginner has to contend with is swarming. Only experience gained by actual practice can teach us how to control swarming, but in order to know what steps to begin with, look up swarming in the book which you have bought and try as best you can to follow out the suggestions given. Also read very carefully all that you can find on "Comb Honey Production."

Beginning with your first season, get these fundamental facts into your mind and always keep them before you if you want to be a successful beekeeper. First—In order to get a honey crop you must have a large surplus of bees, and the bees must have an abundance of room in which to store honey and ripen it. Second—Certain manipulations of the colony are necessary at very definite periods dependent upon climatic conditions, honey flows and the separate status of each colony within its own hive. If these manipulations are not made at the proper time, it may mean the total loss of a crop for a given colony. Third—The preparation of the colony for any season's honey flow begins in the previous fall. Requeen in the middle of the summer, see that an abundance of young bees are reared in the fall, and see that they have plenty of stores for winter. Then in the spring provide the care recommended in this paper and if there is a honey crop, your bees will get it.

A poor, spindling, weak young tree is practically worthless. The best and most vigorous trees are the only ones that a really up-to-date grower will buy. A weak young tree of small diameter and with no root system is much like a runt pig—neither one ever amounts to much.

Subscribe to the American Fruit Grower Magazine—3 years for $1.00.

Some Interesting Rootstock Figures

by M. J. Heppner

University of California

IN THE October, 1923, issue of the American Fruit Grower Magazine, there appeared an article written by the writer on California rootstocks. This article contained, in par, the percentages of the various rootstocks used for the different kinds of fruits by California nuserymen during 1919. In order to ascertain if any appreciable change has taken place in these figures, the writer made a canvass of California nurserymen during the early part of 1923 asking for the number of trees propagated on the various root-stocks during 1922. This survey met with the approval of the nurserymen as was evidenced by the fact that figures were secured for nearly 10,000,000 trees.

The following table gives the percentages of the rootstocks used by California nurserymen during the years 1919 and 1922:

STOCKS FOR ALMOND:	% 1919.	% 1922.
Almond	67.3	72.0
Peach	32.7	28.0
STOCKS FOR CHERRY:	**% 1919.**	**% 1922.**
Mazzard	78.8	80.4
Mahaleb	21.2	19.6
STOCKS FOR PEAR:	**% 1919.**	**% 1922.**
Japanese	63.0	68.0
French	33.0	23.4
Quince	4.0	6.2
Calleryana	....	2.4
STOCKS FOR PRUNE:	**% 1919.**	**% 1922.**
Myrobalan	63.3	63.8
Peach	21.2	25.2
Apricot	5.1	1.4
Almond	10.4	9.6
STOCKS FOR APRICOT:	**% 1919.**	**% 1922.**
Apricot	49.1	46.8
Peach	27.2	30.7
Myrobalan	23.7	22.5
STOCKS FOR PEACH:	**% 1919.**	**% 1922.**
Peach	98.3	98.0
Almond	1.3	.3
Apricot	.4	1.4
Myrobalan	....	.3
STOCKS FOR PLUM:	**% 1919.**	**% 1922.**
Myrobalan	62.4	57.6
Peach	31.6	29.6
Apricot	4.4	10.7
Almond	1.6	2.1

The above figures bring out some interesting facts. It will be noted that the almond root seems to be gaining favor as a stock for the almond. Although there is not a great difference between the percentages for the two years, the differences are significant enough to show that the peach as a stock for the almond is losing in favor.

The Mazzard root seems to be in greater demand for the cherry now than in 1919. This is probably due to the fact that those who advocate the Mazzard root have more influence than those who stand by the Mahaleb. There is very little definite information as to the relative merits of these two stocks outside of that which has been handed down by tradition. There is no doubt in the writer's mind that there are cherry orchards in California, as well as elsewhere, on Mahaleb root where the owner believes the trees to be on Mazzard, and vice versa. During the past year the value of the Mahaleb root as a stock for the sweet cherry has been made clear to most growers and the writer has no hesitancy in stating that there will be a marked increase in the demand for this stock in the near future.

Although the French pear root was in greater demand than the Japanese root many years ago, it appears to be losing in favor. This can possibly be accounted for by the fact that the French root is more susceptible to blight due to its persistent suckering. On the other hand, the Japanese root has made a poor record in wet soils where the French does well. Recent observations have shown that the original belief of the Japanese root being practically resistant to blight is false. Innumerable cases have occurred within the state where bad cases of blight have appeared on the Japanese roots. Owing to the fact that this root is susceptible to blight, although not as susceptible as the French root, and in view of the fact that the French can withstand greater degree of moisture in the soil, a marked revision may occur in the demand for these stocks, with the French gaining in favor. The quince root is evidently in greater demand now as a stock for the pear than in 1919. This is because growers are beginning to see the value in a dwarf pear orchard. It will be noticed that 2.4 per cent of all trees propagated in 1922 were on the Calleryana root. Owing to its seeming resistance to blight this stock may prove of utmost value in the future as a pear rootstock.

Very little change has occurred in the demand for the prune rootstocks with the exception of the apricot. While 5.1 per cent of all the prunes propagated in 1919 were on the apricot root, only 1.4 per cent of the prunes propagated in 1922 were on this root. This decrease can possibly be accounted for by the fact that lack of affinity exists between most of the prunes and the apricot. The peach root has gained slightly in favor due to the adaptation of the prune to the lighter soils.

The value of the peach as a stock for the apricot is now being recognized. This is the only stock that can be used for the lighter soils, the almond root having been entirely abandoned. The peach root is gaining in favor at the expense of the apricot and Myrobalan roots, especially the former.

The peach on peach root still seems to be the best combination. The demand for the almond root has slightly declined but on the other hand, the demand for the peach on the apricot root has increased to a small extent. Growers are demanding this root in nematode infested areas due to the fact that the peach root is very susceptible to nematode attack. They may regret this move before long, due to the fact that very little affinity exists between the peach on the apricot root although the reverse is satisfactory. Innumerable cases have been called to the writer's attention where disastrous results have occurred due to working the peach on the apricot. Growth seems satisfactory for a few seasons, or generally less, and then the tops break off.

In looking over the figures for the plums, it will be noticed that the only marked difference is in the increased demand for the apricot root. The peach is declining in favor due to its lack of affinity towards certain plum varieties such as the Santa Rosa, Diamond and Kelsey. Although the Myrobalan was the old "stand-by" as a stock for all plums, many growers are not considering it as valuable as they did some years ago. This may be due to the great variations existing in our Myrobalan seedlings caused by the differences in seeds used.

Taken all in all, it appears that our ideas of the merits of the various rootstocks for deciduous fruit trees are gradually changing. With our fruit production problems becoming more perplexing each year, our rootstock problems become correspondingly perplexing. It is the writer's aim to make another canvass of California nurserymen during 1924 in order to secure figures for 1923. It will be interesting to note if any marked changes will come about. It is the writer's belief that some of utmost importance will occur.

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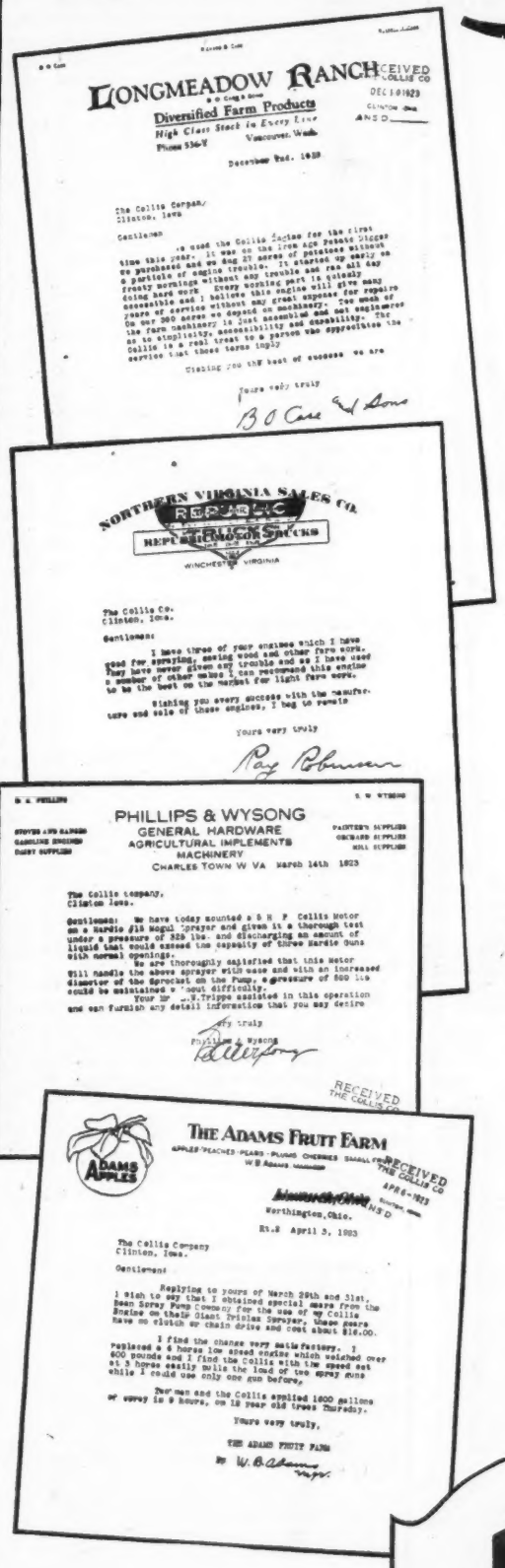
Garden, flower and field Seeds, plants and bulbs. **We furnish best of tested seeds.** Sure to grow. At reasonable prices.

J.W. OSAGE SEED CO., Dept. 57 Ottawa, Ohio

Owners are Staunchest Supporters of COLLIS Engines


LONGMEADOW RANCH
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High Class Stock in Every Line
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Phone 536-Y

December 2nd. 1922

The Collis Company,
Clinton, Iowa

Gentlemen

We used the Collis Suction for the first time this year. It was on the Iron Age Potato Digger we purchased and we dug 27 acres of potatoes without a particle of engine trouble. It started up easily on frosty mornings without any trouble and ran all day doing hard work. Every working part is plainly accessible and I believe this engine will give many years of service without any great expense for repairs On our 960 acres we depend on machinery to put in the farm machinery is just assembled and not engineered as to simplicity, accessibility and durability. The Collis is a real treat to a person who appreciates the service that these terms imply?

Wishing you the best of success we are

Yours very truly

B O Case & Sons

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NORTHERN VIRGINIA SALES CO
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The Collis Co.
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Gentlemen:

I have three of your engines which I have used for spraying, sawing wood and other farm work. They have never given any trouble and as I have used a number of other makes I can recommend this engine to be the best on the market for light farm work.

Wishing you every success with the manufacture and sale of these engines, I beg to remain

Yours very truly

Ray Robinson

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CHARLES TOWN W VA March 14th 1923

The Collis Company,
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Gentlemen: We have today mounted a B H F Collis Motor on a Hardie 4J8 Nogul Sprayer and given it a thorough test under a pressure of 325 lbs. and discharging an amount of liquid that could exceed the capacity of three Hardie Duns with normal openings.

We are thoroughly satisfied that this motor will handle the above sprayer with ease and with an increased diameter of the Sprocket on the Pump, a pressure of 500 lbs could be maintained without difficulty.

Your Mr ...B.Tripps assisted in this operation and can furnish any detail information that you may desire

Very truly

Phillips & Wysong

P W Phillips

RECEIVED THE COLLIS CO

ADAMS APPLES
THE ADAMS FRUIT FARM
APPLES-PEACHES-PEARS-PLUMS-CHERRIES-SMALL FRUITS
W B Adams Manager
Worthington, Ohio.

R.2 April 3, 1923

The Collis Company
Clinton, Iowa.

Gentlemen:

Replying to yours of March 29th and 31st, I wish to say that I obtained special gears from the Bean Spray Pump Company for the use of my Collis Engine on their Giant Triplex Sprayer, these gears have no clutch or chain drive and cost about $16.00.

I find the change very satisfactory. I replaced a 4 horse low speed engine which weighed over 600 pounds and I find the Collis with the speed set at 3 horse easily pulls the load of two spray guns while I could use only one gun before.

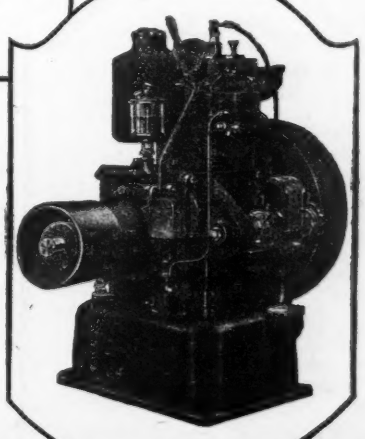
Two men and the Collis applied 1600 gallons of spray in 8 hours, on 18 year old trees Thursday.

Yours very truly,

THE ADAMS FRUIT FARM

By W. B. Adams Mgr.

THE COLLIS GASOLINE ENGINE



The COLLIS COMPANY

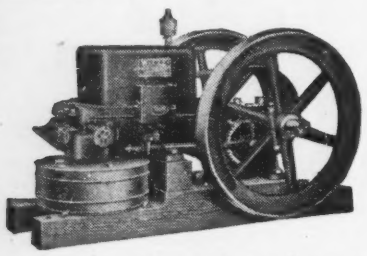
1504 Lincoln Highway

CLINTON, IOWA

EASY NOW TO OWN THE FAMOUS WITTE ENGINE

Now Ed. H. Witte, World-Famous Engine Manufacturer, Offers to Put An Engine On Your Place For Only $14.24.

The famous WITTE Throttling-Governor ENGINE would seem to be within the reach of every farmer now. Ed. H. Witte, known all over the world as master engine manufacturer, announces that he is prepared to put a 2 H. P. engine on any farm for as low as $14.24 or a 5 H. P. engine for as low as $31.12. Though the prices on the Witte Engine are lower than ever before, this engine is now equipped with celebrated WICO Magneto, the best system of high-tension ignition known



This engine has revolutionized power on the farm as it handles practically every job at a fraction of the usual cost. Easily moved from one place to another, it is trouble-proof and so simple that a boy can operate it. Also the most economical, as it develops a big surplus of power on either kerosene, gasoline, distillate or gas. More than 100,000 are in use.

To introduce this remarkable engine to a million new users, Mr. Witte will send it anywhere, direct to you, for a guaranteed 90-day test. You may have nearly a year to pay the small balance.

Every reader of this paper who is interested in doing all jobs by engine power should write today for a free copy of a remarkable book just issued by Mr. Witte, which explains the engine fully. You are under no obligations by writing. Just send your name, a post card will do, to the Witte Engine Works, 2140 Witte Bldg., Kansas City, Mo.; or 2140 Empire Bldg., Pittsburgh, Pa.. and this interesting and valuable book will be sent at once.

PLANS for Poultry Houses All styles, 150 illustrations, secret of getting winter eggs, and copy of "The Full Egg Basket." Send 25 cents. INLAND POULTRY JOURNAL, Dept. 58, Indianapolis, Ind.

ALUMINUM CHICK FEEDER 30c for FEED, GRIT, MILK or WATER. Simple, safe and sanitary. Chicks cannot get feet into contents. Send 30c. each or stamps for one postpaid. Money back if not satisfied. American Poultry Journal, 427-523 Plymouth Ct., Chicago

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If your dealer cannot supply you, send us $5.50 and his name ($6.00 in the far west). Knapsack extra. Send for catalog D.

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The Pump of a Hundred Uses

Causes of Good and Poor Fertility in the Poultry Flock

by H. A. Bittenbender

THERE is no question but that the male is at least one-half of the breeding flock, and in many cases it proves to be of even greater importance. For this reason, particular attention should be taken in the feeding and management so as to keep up the vigor, vitality, constitution and activity of the males. In order to do this, care must be taken in the selection, but even after the proper males have been put into the flock, it is entirely possible to ruin the chances of getting a large number of fertile eggs.

Perhaps the first essential is to have the right proportion of females in the flock, and no definite rule can be laid down, but generally we can use the following as a guide.

Mediterranean breeds—Early part of season, one male to 14 females. As the season advances, this may be increased to 25.

American breeds—One male to 10 females early in the season. One to 15 later.

Asiatic and English breeds—In many cases it has been found advisable to use a lesser number of females than that of the American breeds.

The reason for recommending the smaller number of females earlier in the season is due to the fact that inactivity of the male, due to cold weather, is probably the cause.

A method that can be used is to keep the hens that are not laying earlier in the season during the colder weather in a pen by themselves, and as they come into laying put them into the breeding pens. In this way it is possible to insure a greater percentage of fertility from the ones that are laying during the earlier part of the season. It is not necessary to have a trap nest in order to do this. With careful observation and handling it is possible to pick out the hens that are laying from those that are not.

If, when the breeding pens are mated, no males have been running with the females, it is safe to save eggs in five to six days after mating the pens in the case of the Mediterranean breeds, and it is better to allow 10 days in the case of the heavier breeds. If, however, males have been running in the flock, and it is desired that the influence of the fertility of these males be eliminated, it is necessary to allow 21 days before saving the eggs for hatching.

Management.

There are a number of factors that influence to a marked extent the fertility of the eggs. Perhaps the greatest one of these factors is confinement. Confinement not only reduces fertility but decreases hatchability. Fertility is different than hatchability. Fertilit · is the fertilization of the egg. If the germ does not start to develop at all it is termed that the egg is infertile. If, however, the germ does start to grow but does not develop into a chick that is hatched we call them "dead germs" or say that a flock has poor hatchability because of the large number of embryos that do not produce chicks, while a flock that has poor fertility is where there is a lack of fertilization or a large number of eggs where the embryos do not start to develop. It is generally supposed that the male affects the fertility the most and that the hen has the greatest influence on hatchability, although both may be at fault.

In order to get a high percentage of fertility and hatchability, it is necessary to give the flock plenty of range when this is possible. If it is not possible to give the flock range, every precaution should be taken to provide all of the necessary essentials that the birds would pick up on range. The most important of these are direct sunshine, green food, and exercise.

Another reason why free range often increases fertility is that opportunity is given for the birds to scatter out, and this prevents so much of the fighting on the part of the male birds.

The breeding house should be so constructed that the windows and curtains can be raised on sunshiny days to allow the direct sunshine, unintercepted by glass, to come into the house. This has a great stimulating effect, puts the birds in a happier, more active condition, dries out the house and keeps the birds healthier.

If the birds are given range when there is not an outdoor supply of green food, it should be supplied. Sprouted oats, lettuce or Swiss chard are perhaps the easiest means. Alfalfa or clover leaves, if they are fine and can be utilized by the chickens, are excellent. They may either be fed dry or steamed.

Feeding.

A well-balanced mash should be kept before the birds at all times. The following mash has given good results: 100 pounds ground corn; 100 pounds ground oats; 100 pounds bran; 100 pounds middlings; 75 pounds tankage. If an ample supply of buttermilk or skim milk can be kept before the birds at all times, the tankage can be cut down to 45 pounds. It has been found that the addition of milk increases the hatchability to a marked extent.

The scratch grain to be fed with a mash mixture of this kind is as follows: Two pounds shell or coarse cracked corn; one pound whole oats; one pound whole wheat. Plenty of grit and oyster shell should be kept before the birds all the time. Where milk, skim milk or buttermilk is provided, it is not necessary to furnish water. However, it is highly important that a sufficient quantity of liquid be kept before the birds continually so that they have plenty to drink.

In feeding, particular attention should be taken that too much grain is not given as this has a tendency to make the birds overweight and reduces the amount of mash eaten and quickly lowers the egg production. A good proportion during cold weather is one part of mash to two parts of grain. If this proportion can be maintained in cold weather, the weight of the birds will be kept up, and as the production advances, the proportion changed to equal parts of grain and mash.

Green feed can best be supplied daily in as large a quantity as the birds will consume in a short time. Where this plan of feeding has been carried out, good results have been obtained in both fertility and hatchability.

Oregon Walnuts

WE RECEIVED from Charles Trunk of the Oregon Walnut Farm, Dundee, Ore., a fine box of choice Franquette walnuts. To receive walnuts from Mr. Trunk means that you are receiving the best in America as no one grows finer walnuts than Charles Trunk. He has a beautiful, large, partly grafted and partly seedling walnut orchard, together with a fine block of prunes. The farm is one of the show places in Oregon. Everything is immaculate. The fence posts are built of cement. There are no waste places.

Not only is Mr. Trunk successful in growing but he is one of the best experts in the washing, grading and curing of walnuts. He invented a number of years ago a very unique washing and grading machine for the handling of walnuts.

Oregon Franquettes are practically in a class by themselves when it comes to quality in walnuts.

(Classified advertisements on page 49)

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Remarkable Discovery That Cuts Down the Cost of Paint Seventy-Five Per Cent.

A Free Trial Package Is Mailed to Everyone Who Writes.

A. L. Rice, a prominent manufacturer of Adams, N. Y., discovered a process of making a new kind of paint without the use of oil. He named it Powdr-paint. It comes in the form of a dry powder and all that is required is cold water to make a paint weather proof, fire proof, sanitary and durable for outside or inside painting. It is the cement principle applied to paint. It adheres to any surface, wood, stone or brick, spreads and looks like oil paint and costs about one-fourth as much.

Write to A. L. Rice, Inc., Manufacturers, 12 North St. Adams, N. Y., and a trial package will be mailed to you, also color card and full information showing you how you can save a good many dollars. Write today.

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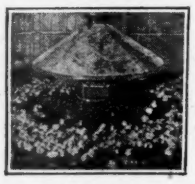

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They're so sturdy, healthy, full of vitality we guaranteed 100% live delivery and that they will live after you get them. The secret of this guarantee is pure-bred, vigorous breeding stock, brought by years of experience to an exceptional standard of health and heavy laying. Reiling Chicks are easy to raise and pay big profits. All leading varieties. Illustrated Catalog Free. Lewis A. Reiling, Box 537 Bellevue, Ia.

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64 BREEDS Most Profitable chickens, ducks, turkeys and geese. Choice, pure-bred northern raised. Fowls, eggs and incubators at low prices. *America's great poultry farm.* At it 31 years. Valuable 100-page book and catalog free.
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Kokomo Fence Mfg. Co.
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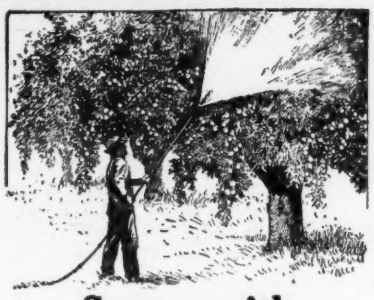

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With steady, unfailing, reliability, this engine helps you finish your spraying quickly and thoroughly. A Hercules engine just eats up big jobs.

The same dependability that you find in a Hercules orchard sprayer engine is typical of all other Hercules-equipped farm machinery. There is a Hercules engine for nearly every job on the farm from mixing cement to filling silos. They range from 1½ H. P. upward.

On leading makes of farm machinery, well-posted salesmen will call your attention to the Hercules engine as proof that the best power is provided. You can also buy the Hercules engine as a separate power unit and use it as your work requires.

A dealer selling Hercules engines and Hercules-equipped farm machinery is sure to be located near you. If you wish us to help you with suggestions on how to use power effectively and profitably, we will be glad to have you write us direct.

The Hercules Corporation
Engine Division, Dept. H
Evansville, - Indiana

HERCULES ENGINES

BABY CHICKS Postpaid to you. 100% live arrival. Purebred Barred Rocks, Reds, Anconas, 25-$4.50; 50-$8; 100-$15. White or Brown Leghorns, 50-$7; 100-$13; 500-$60. Etc. Ten other breeds. Catalog free. Bank reference. Booth Farms, Box 520, Clinton, Mo.

SHENANDOAH VALLEY BABY CHIX

Husky chicks inheriting superior business qualities from healthy, closely-culled breeding flocks which enjoy free farm range the year 'round. Five popular breeds.

The strength-building limestone soil, blue grass ranges, pure water and favorable climate, all aid us in producing chicks that are

FULL OF VIM—VIGOR—VITALITY

We ship to all points east of the Rockies, delivery charges prepaid, and guarantee safe delivery of as many chicks as you order. Can usually make quick delivery, hatches every week, but order early to be sure of delivery at the time you specify. Write for catalog and prices—both interesting.

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408 Central Bank Building, Columbus, O.

Georgia Peach Growers' Exchange Takes Out Insurance Policy

by J. H. Reed

FOR THE first time in the history of the South—probably for the first time in the history of the country also—a co-operative organization has taken out an insurance policy covering the cost of production and cost of marketing the product of its members.

The organization taking out the policy is the Georgia Peach Growers' Exchange, with headquarters in Macon, Ga., and the insurance policy, of course, covers the cost of production and marketing of the product of its members, namely, peaches. A policy covering the cost of production and marketing, based upon the number of trees he has, will be issued this year to each member of the Exchange.

One does not have to know anything about peaches to see the far-reaching effect of this policy; but if one does know a little about this fruit, he can see the effect all the clearer.

Hitherto the one deterring feature of the business has been the perishable quality of the fruit. Peaches cannot be held like apples or potatoes, they must be marketed at once; and before the Georgia Peach Exchange took hold of the crop, every grower rushed to market at once, prices were demoralized and instead of a profit, everyone encountered a more or less heavy loss.

Again, rushing the fruit to market caused gluts on the larger city markets, such as New York, Boston and Chicago. This resulted in a low price and a loss and the Georgia Peach Exchange has been engaged since its formation in establishing new markets, distributing the shipments in an orderly manner and arranging for diverting points, so that the fruit of its members might be shunted at an hour's notice to the market where the best prices prevailed. In all of this work, the Exchange has been very successful. But in issuing policies guaranteeing the cost of production and marketing, the Exchange has taken a great forward step in protecting its members and in gaining the confidence of peach growers still outside of the organization. If every grower could be assured that he would not lose anything in his production, it would revolutionize the fruit growing industry.

The issuance of these policies against loss to the grower is not only a splendid protection to the peach growers themselves but a splendid reflection on the work being done by the organization.

The Peach Exchange, through its system of pooling and marketing, showed itself so capable of making a profit for its members that the insurance company had no hesitancy in covering the fruit with its policies. While the name of the insurance company has not yet been given out, it is understood that it is one of the largest companies of its kind in the United States.

The cost of insurance will be deducted from the sale of the fruit—along with other expenses incidental to the Georgia Peach Exchange—and so will not be very sharply felt by the producer.

More than 6000 trees will be insured at once against all hazards, it was announced at the Peach Exchange, and ultimately more than half of the 12,000,000 bearing peach trees in the state will come under the insurance being issued by the Exchange.

Cook County, Ill., provides the following vital statistics. The county has issued 1,000,000 marriage licenses. Weddings increased, in 1923, 13 per cent above the highest previous year. So far so good. Divorces increased 25 per cent, or, in other words, one marriage in every five went wrong. Were people more happy in marriage formerly, or did they just stand the gaff more heroically?

Crop Values and Freight Rates

WHETHER the farmer can get good railroad service when he needs it is of vital importance to him. The present rates for such service are so small compared with the value of farm products that they are hardly a factor in the farmer's adversity or prosperity.

A report issued by the United States Department of Agriculture, and published in its bulletin on "Weather, Crops and Markets" for December 29, 1923, estimates that the total **farm value** of all crops in 1923 was **two and one-half billion dollars greater** than in 1921.

Increase in Farm Value of Crops

Here are the facts regarding the farm value of crops as estimated by the Department of Agriculture:

Farm Value of Crops in 1921..$6,934,000,000
Farm Value of Crops in 1923.. 9,471,000,000

Increase in Two Years $2,537,000,000
or 36½ per cent.

The total freight charges of the railways on farm crops carried in 1923, as indicated by the statistics of the Interstate Commerce Commission were $621,300,000.

The mere **increase** in the farm value of crops between 1921 and 1923 was **four times as great as the total freight charges paid** on the portion of farm crops shipped by railroad in 1923.

The total **farm value** of the crops in 1923 was **more than fifteen times as great** as the total freight charges paid on farm crops. Not all the crops grown are shipped; but, of course, freight does not have to be paid on the parts that are not shipped.

Wheat, Corn and Cotton Values and Freight Charges

How little effect the freight rates charged have upon what the farmers receive for their crops is strikingly illustrated by the changes that have occurred within the last two years in the farm values of wheat, corn and cotton and the freight charged upon them.

The freight charges on the wheat shipped by railroad were reduced $23,000,000 between 1921 and 1923. But the **farm value** of the wheat crop declined $29,300,000 between these years, **and in consequence the farmer got less** for his wheat than he did before the rates were reduced.

The freight rates on corn were reduced $22,500,000 in these two years; and the value of the corn crop increased $925,000,000. This increase in the value of the corn crop was **forty-five times as great** as the reduction in freight rates, and **almost eleven times as great** as the total freight charges paid on corn in 1923.

The freight rates on cotton were reduced $4,250,000. The increase in the **farm value** of the cotton crop in these two years was $918,000,000. This was **two hundred and sixteen times** as great as the reduction in rates and **twenty-four times** as great as the total freight charges paid on cotton in 1923.

Why Freight Rates Must Be Maintained

The foregoing striking facts prove that the prices which farmers receive for their products depend upon general market conditions and not upon freight rates.

But, whether the railways can render the farmers and other shippers good and adequate transportation service will **depend entirely** on whether they are allowed to charge rates that will enable them to pay their operaing expenses, taxes and interest and dividends on capital that will be attractive to investors.

If operating expenses and taxes could be reduced, the railways would be glad to convert the reduction into lower rates.

Freight rates for the present must be maintained for the welfare of the farmer himself. They cannot be reduced while present high wages, other operating expenses and taxes prevail, without seriously crippling the service the railways can render farmers and other shippers.

This is one of a series of advertisements published to give the farmer authentic information about railroad matters. Any questions that you would like to ask will be cheerfully answered. Address:

WESTERN RAILWAYS' COMMITTEE ON PUBLIC RELATIONS
650 Transportation Building, Chicago, Illinois

S. M. FELTON, President, Chicago Great Western Railway,
L. W. BALDWIN, President, Missouri Pacific Railroad Co.
RALPH BUDD, President, Great Northern Railway,
H. E. BYRAM, President, Chicago, Milwaukee & St. Paul Ry.,
W. H. FINLEY, President, Chicago & Northwestern Railway,
CARL R. GRAY, President, Union Pacific System.
J. E. GORMAN, President, Chicago, Rock Island & Pacific Railway,
HALE HOLDEN, President, Chicago, Burlington & Quincy Railway,
C. H. MARKHAM, President, Illinois Central Railway,
C. E. SCHAFF, President, Missouri-Kansas-Texas Lines.

Farmers! Here Is Your Own Borrowing and Investing System

THROUGH the twelve Federal Land Banks, farmers own and operate a huge national co-operative borrowing and investing business. Already, these Banks have resources of over $880,000,000! They are supported by more than 4,500 local National Farm Loan Associations with a membership of nearly 300,000 farmers.

After paying the costs of operation and setting aside necessary reserves, all profits are returned to the borrowing farmers through their local associations. To date, over $7,000,000 has been paid as dividends.

A Federal Land Bank mortgage need never fall due. It is gradually retired by the semi-annual payment of a uniform sum, equal to the interest on the amount borrowed plus ½ of 1% of the loan. For example, the farmer with a mortgage of $1,000 at 6% pays $35 every six months. This includes the interest and a payment on the principal sufficient to cancel the loan in about 33 years.

When You Have Money To Invest

Every farm family should support their co-operative Farm Loan System by investing in Federal Land Bank Bonds. This can be started with a single Bond—$40, $100, $500, $1,000, $5,000 or $10,000—and increased as the money can be spared. These bonds are safe. No investor in them has ever lost a dollar. They are free from all taxes, except inheritance taxes. This applies to both principal and interest.

Should you need money quickly, these Bonds command a ready market, or your banker will accept them as security for a loan.

You can buy these Bonds from any Federal Land Bank or from the Fiscal Agent at Washington, D. C. The Bonds will be sent by registered mail. All correspondence confidential. Remember that the words "The Federal Land Bank" appear at the top of every Bond issued by a Federal Land Bank.

Write today for "Federal Farm Loan Board Circular No. 16." It's free.

If you desire a Federal Farm Loan, apply to the Secretary-Treasurer of the nearest National Farm Loan Association. Ask your County Agent for his address.

The Federal Land Banks are located at

Springfield, Mass.	St. Louis, Mo.	Louisville, Ky.	Columbia, S. C.
New Orleans, La.	Berkeley, Cal.	St. Paul, Minn.	Houston, Texas
Wichita, Kansas	Omaha, Nebr.	Baltimore, Md.	Spokane, Wash.

Fiscal Agent

FEDERAL LAND BANKS
Washington, D. C.

SAVE 50¢ A ROLL
Ward's RADIO ROOFING

Regular 85-pound standard weight

Don't confuse this full-weight 85-pound roofing with cheaper, lighter roofing sold at the same price.

Lay it over old roofs. There is enough in one roll to cover 100 square feet—yet a roll costs only $1.85, with nails and cement.

Fire Underwriters Approve It

Radio Roofing is surfaced with red or green slate that beautifies as well as protects it. Resists fire. Not affected by heat and cold.

We guarantee it for 15 years:—it should last many more.

Send for Free Sample

Examine it! Cut it open! Test it. Judge its remarkable quality. Write for free Building Material Catalogue.

Order the roofing you need. Catalogue No. 174-M00. State color—red or green.

Shipped From	*Price Per Roll*	*Order From*
Chicago	$1.85	Chicago
York, Penna.	1.85	Chicago
Southern Illinois	1.95	Chicago
New Orleans	1.95	Chicago
Kansas City	2.00	Kansas City
St. Paul	2.00	St. Paul
Portland, Ore.	2.65	Portland
Houston, Texas	2.45	Ft. Worth
Oakland, Calif.	2.65	Oakland

Add 10c for extra long nails
Shipping weight 85 pounds per roll

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POSTPAID, 100% LIVE DELIVERY. Give us your order for our RELIABLE CHICKS and we will prove to you IF BETTER CHICKS COULD BE HATCHED FOR THE MONEY WE WOULD BE HATCHING THEM.

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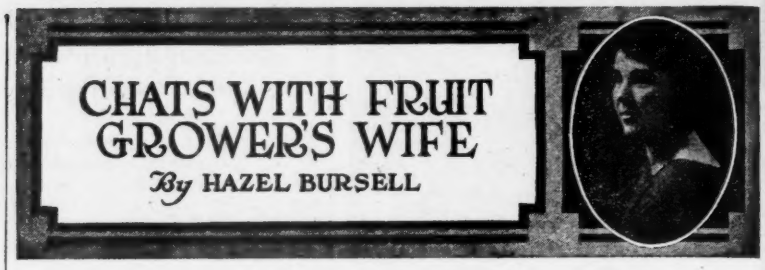
FINE ILLUSTRATED CATALOG FREE. Tells how we produce RELIABLE CHICKS that have pleased thousands of customers. We hatch 13 Varieties. COMBINATION OFFERS. VALUABLE BOOK GIVEN FREE with each order. HUBER'S RELIABLE HATCHERY, Court High St., Fostoria, Ohio.



Cleaning and Polishing Metals

HAVE you been neglecting your silverware, aluminum, brass and other household metals? Are they the "skeletons in your closet" just waiting for the chance to jump out at you at most inconvenient times? Let's get rid of the skeletons this spring at house cleaning time!

One of the main reasons the cleaning and polishing of metals is "put off" from month to month is that the housewife does not know the methods that insure the nicest polish with the least effort and expense. Then, too, it is somewhat tedious, but if not neglected it will not be so much so.

Six Causes of Tarnish.

There are six causes of tarnish on metals—sulphur fumes, coal smoke, gas, oxidation (from exposure to air) rust and acids. Knowing these, the housewife should make an effort to avoid too frequent polishings by keeping metals from contact with them, insofar as is possible. She knows that the yolk of egg contains sulphur, therefore, her silverware should not be allowed to remain unwashed after eggs have been eaten. A thorough daily washing and drying of kitchen ware will take care of the coal smoke and gas stains pretty well—remove them each day with some kind of scouring powder. Articles of brass and copper which need not be washed often may be given a coat of clear lacquer just after a thorough polishing. Then they should not be polished again, unless they are to be relacquered.

The usual materials for polishing metals are washing soda, salt, lemon juice or vinegar, ammonia, whiting paste, certain dilute acids, steel wool, Bon Ami, kerosene and jeweler's rouge. Whiting is an excellent all-around polish, and should be kept in the household where there are many metals.

Silver—There is a new and entirely satisfactory method of polishing silver that requires little time and effort—and no "elbow grease." Lay the silver in a brightly-polished aluminum pan, add one teaspoonful of Sal Soda and one teaspoonful of common table salt. Then pour boiling water over the silver and let stand from three to five minutes. An electric current is set up in the pan which removes the oxygen or sulphur from the silverware and deposits it on the sides of the pan. The aluminum pan must be brightly polished or no current will be set up. No silver is removed from the tableware in the process. The only disadvantage is that the housekeeper now has the aluminum pan to polish. An oil rub at the last gives a satiny polish to the silver.

Another way is to rub with whiting paste or silicon and ammonia, or a good commercial polish. Lard gives a satiny finish as does the oil. The silver should be carefully washed and dried after the polish, of course. The selection of silver with little or no intricate designing will greatly aid the housekeeper, both by making fewer polishings necessary and being more easily cleaned.

Steel Ware—Polish by rubbing a cork into powdered bath brick and then over the moistened steel. Rinse and dry thoroughly. Fruit acids are the main causes of stains on steel. An ordinary red brick may be powdered and it will give just as good service. Shave off the amount needed at each polishing.

Brass and Copper—Remove bad tarnish from brass and copper with vinegar and salt or lemon juice and salt—just enough of the acid to moisten the salt into a paste. Polish quickly and rinse off thoroughly. Then polish with a paste made by mixing rottenstone with olive oil, sweet oil or linseed. Wash, rinse and polish with a flannel cloth or chamois. This last gives the soft, satiny finish desired.

Nickel—The easiest way to polish nickel is to rub with Bon Ami and then polish when dry. Nickel can also be polished with whiting and ammonia or with lard and whiting. The Bon Ami method is much simpler.

Iron—Iron kettles and iron frying pans may be put in the furnace or heating stove and the black deposit on the outside burned off. The iron will not be injured and will come out clean. Stoves should be washed every day, followed by an oil rub to prevent rusting. Steel wool, size "Double-O," may be used to remove burned materials.

Zinc—Clean zinc by rubbing with a kerosene rag.

Aluminum—Fill the utensil with water containing a little vinegar and boil five minutes or until clean. Wash thoroughly and dry. A good commercial scouring powder will also do the work quite nicely. Steel wool is often advocated for the inside, but it will wear off the aluminum to some extent. The best outside polish is whiting mixed to a paste with ammonia or alcohol. It is important that aluminum be cleaned each day, instead of being neglected for months and then given a deep scouring.

Folding and Ironing

THERE is a convenient and proper way of ironing and folding, and the work may be done as easily in the right way. If done correctly, the garments and household linens will "look right" when finished, otherwise they will not.

To begin with, have plenty of clean, smooth hot irons. If you use the heated-on-the-stove variety, have two sets so that you will always have a hot iron. You can number the irons with chalk so that you will know which to use—use them in order each time, of course.

Do not have the ironing board too far from the stove or you will have to take many extra steps each time. A smooth, well-padded ironing board of the proper height is another ironing-day necessity.

Evenly dampened clothes, which have been properly starched to iron easily, will do much to lighten the work. Linens should be quite damp, and require a very hot iron to give the best results. Thin, sheer materials should also be very damp as they dry out quickly, one part of the garment getting dry while you iron the other.

Most silks should be ironed wet—roll them while wet in a Turkish towel for a while before ironing. Pongee has the best color and luster when allowed to dry before ironing, being then ironed with a very hot iron. Pongees have a greenish color when ironed wet, and spot badly if sprinkled. Be careful not to scorch silk garments which are ironed wet.

Folding Household Linens.

Towel—Iron smoothly and then fold lengthwise twice—if plain, fold in quarters; if embroidered fold in thirds to display the design. Then fold crosswise once or twice, depending on the size of the towel. Dish

towels are handled the same as hand towels.

Napkin—Start to iron the napkin with the hemmed edges to the right and left. Iron on the wrong side of the linen. Have the unironed part toward you to prevent "mussing" the ironed part.

To fold, bring the back selvage over to the front, then bring the fold forward again. The folds may be pressed in lightly. Then bring the right end over unto the left, and fold again in the same way.

Tablecloth—Large tablecloths may be folded before ironing to decrease the size of the cloths. Fold the two selvages together. The center fold does not always need to be in the same place, to prevent the wear all coming on the same line. The first center fold may be pressed in lightly. All later folds should not be pressed in at all. Fold several times lengthwise and then put in as many crosswise folds as are needed.

Sheet—Sheets are ironed in much the same way. Many persons use them for ironing pads, neatly folded under the cover, and then merely find it necessary to press the hems. Sheets should be folded lengthwise twice and then crosswise several times. The folds in sheets are pressed in.

Pillowcase—Iron on both sides and fold twice lengthwise, usually in thirds, to display the monogram or other handiwork to advantage. Then fold once or twice crosswise, as desired.

Never iron things which do not need it. It is utter waste of energy and time to iron every old rag that is washed. Many types of garments are just as good looking and comfortable unironed. Many persons like the "feel" of unironed sheets. Think it over before doing useless ironing.

Rugs at Angles Inartistic

NOW THAT it is time for the annual spring "shake-up" known as "House Cleaning," why not try rearranging some of the furniture and rugs to see what new and charming effects can be brought about?

The matter of placing rugs is particularly important. Many otherwise good rooms are spoiled by rugs placed cornerwise and at every conceivable angle, and their owners never seem to know it but they go blissfully on their way at peace with the world.

Perhaps some have the idea that a rug placed at an angle seems to fill more space than if placed parallel to the baseboards or to a piece of furniture, which is the correct arrangement. The room will gain in dignity and seem more orderly with the rugs arranged parallel to the wall. The "angle" arrangement is often used, also, to give the effect of leading from one place to another. This is not at all necessary.

Let us rearrange and straighten our small rugs this spring and note the difference it makes in the appearance of our living rooms. It may require some changes in furniture placing also, but that also should help to make our rooms seem like new.

Cottage Cheese Recipes

DO YOU and your family know how good cottage cheese really can be, when properly prepared and nicely served? If not, then it's time you made its acquaintance. With that in mind I have elected to give a few good recipes for its use in the diet.

Cottage cheese, to be at its best, should have some fat in it—that is, part or all of the cream should be left in the milk from which the cheese is made, or cream added after the whey is removed. The sour milk should be gently warmed, and not boiled, in removing the whey. Better still, pour hot water over the cheese in a cloth bag, or fine strainer. When properly made the cheese is wholesome and nourishing, being rich enough in both fat and protein to take the place of meat once a day in the diet. It is used often in salads, desserts, sandwiches, croquettes and omelets.

Cottage Cheese Omelet.

2 eggs.
¼ t. salt.
3 rounded T. cottage cheese.
2 T. chopped pimentos.
2 T. milk.

Beat the yolks and whites separately. Add to the yolks the salt, milk and cheese with which have been blended the pimentos. Fold in the egg whites, stiffly beaten. Pour into a hot frying pan in which has been melted ½ T. fat. Cook the omelet slowly until the egg has set, place in the oven a few minutes to finish cooking and fold over in the center. Garnish with parsley and serve at once. Other seasonings may be used, such as chopped parsley, green pepper or minced ham.

Cottage Cheese and Potato Croquettes.

1 c. cottage cheese.
2 T. chopped parsley.
1 t. chopped green pepper.
¼ t. soda.
½ t. salt.
Dash of cayenne.
Dash of paprika.

Mix these ingredients thoroughly and form into small rolls. Then imbed the rolls in mashed potatoes which have been seasoned with salt and pepper, forming larger rolls. Finally roll the croquettes in egg and bread crumbs. Fry in a pan containing 1 T. hot fat or brush with melted fat and brown in a hot oven. Serve hot.

Cottage Cheese Tomato Salad.

1 pt. cottage cheese.
1 head lettuce.
2 large tomatoes.
1 green pepper.

Slice tomatoes, place a slice on a lettuce leaf, heap with cheese. Quarter two slices of tomatoe and set around the cheese. Pile a teaspoon of mayonnaise on top and garnish with shredded green pepper or stuffed olives. This amount will serve six.

Pimento and Cheese Salad.

3 c. cottage cheese.
¼ c. pimento, chopped fine.
6 lettuce leaves.

Mix cheese and pimentos together, shape into balls and place on lettuce leaves, three small balls to the serving. Add a teaspoon of salad dressing and garnish with stuffed olives, or dill pickles, or both. A sprig of parsley would do in the absence of the others.

Cheese and Pineapple Salad.

Place a slice of pineapple on a crisp lettuce leaf. Heap with cottage cheese and add a spoonful of mayonnaise or dressing made from the pineapple juice. Add a dash of paprika for color and flavor.

Stuffed Pepper Salad.

Cut the ends and remove the seeds from green peppers of uniform size. Immerse the peppers in boiling salted water for 10 minutes to make them slightly tender, but not soft. When cold fill the peppers with cottage cheese into which has been carefully folded any desired amount of minced ham or any left-over meat, and sufficient salad dressing to give flavor. On top of each stuffed pepper put a spoonful of dressing and serve in a nest of cold vegetable, or, if desired, merely in the center of a lettuce leaf. A red garnish, as a radish or two, or small pickled beets, would add a pleasing color note.

Pepper Salad.

Prepare two green peppers as in the stuffed pepper salad. When cold slice into rings about three-eighths inch deep. Arrange these rings on lettuce leaves, three to the plate, if not too large rings. Fill the rings with cottage cheese which has been mixed with either boiled dressing or mayonnaise for flavor and color. Pack the rings level full and place a spoonful of dressing in the center of the plate. Add a dash of paprika. When properly made the little pepper rings look like flowers with yellow petals and green borders.

Vegetable Salad.

Arrange sliced tomatoes on a bed of crisp lettuce leaves. Then heap with a mixture of grated uncooked carrots and shredded cabbage. Top with a spoonful of cottage cheese. The cabbage and carrots may have dressing mixed with them or it may be piled on the lettuce leaf beside the salad. A dash of paprika on top of the cheese will add color.

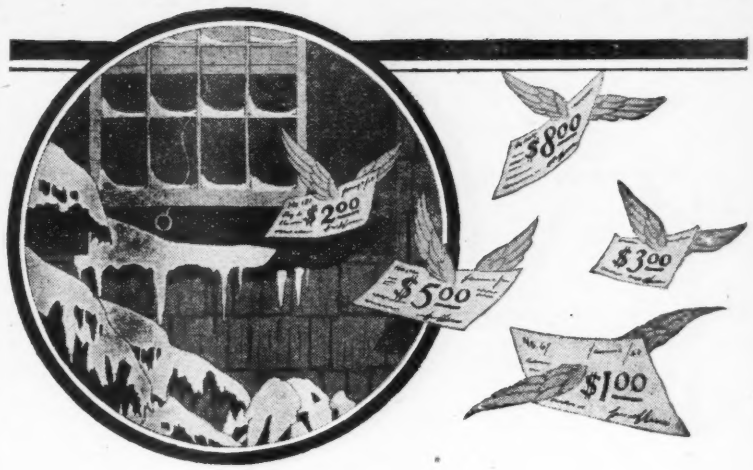
Club House Sandwiches.

Toast three large slices of bread on one side only (the slices should be thin). Two slices may be buttered. Cut diagonally across the slices as soon as buttered, as they can be cut better before putting in the filling.

Now spread one slice with cottage cheese and lay a lettuce leaf on it. Then place another slice on top and fill with any one of the following, placing the third slice on top and cutting down through the fillings:

1. Thin sliced cold ham spread with mustard, lettuce and mayonnaise.
2. Sliced tart apple, nuts, lettuce and mayonnaise.
3. Minced chicken, lettuce and salad dressing.
4. Two tiny strips of bacon, lettuce and mayonnaise.
5. Tomato, lettuce and mayonnaise dressing.
6. Marmalade or a paste made of dried fruits—raisins, dates, figs, etc. Do not use mayonnaise with these.

c. = cup.
t. = teaspoonful.
T. = tablespoonful.
All measures are level.



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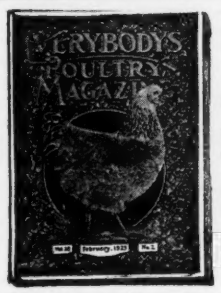

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The Farmer as a Plumber

by E. W. Lehmann

THERE are many simple jobs of plumbing about the farm home, such as installing a sink and drain, connecting up a hot water tank and making repairs that the average farmer can easily do with the tools he has at hand. When it is necessary to install a complete plumbing system with sanitary toilet and other fixtures, it is always desirable to get a good plumber to make the installation.

In nearly every community there is a plumber who will gladly cut and thread pipe to be used in making a simple installation. Most plumbers prefer that the farmer do these small jobs because the labor charge on such work nearly always appears unreasonable. It is usually true that for the small job we can expect the labor charge to be a much larger per cent of the total cost than for a complete system.

Under the city ordinance regulating the work of plumbing, it is specified that no plumbing of any kind shall be done without a special permit from the supervisor of plumbing, whose duties are to inspect the work when complete to see that it meets all the requirements. This is necessary to protect the people against poorly installed plumbing, which would result in unsanitary and unhealthful conditions. Out in the open country beyond the city limits the farmer has only himself and family to consider. There are no laws governing the type of building he constructs or how his equipment is installed. He should keep in mind, however, that what is good for the protection of his city brother's family is also good for the protection of his own family.

Extreme care should be observed in the installation of any plumbing equipment. The principles of drainage and the principles of sanitation should always be kept in mind. Simplicity should be one of the chief points in planning a plumbing layout. In a simple, compact plumbing system there is less danger of stopping up, due to long drainage lines, on account of greater distance between fixtures and the outlet drain. Where the bathroom is to be on the second floor, it is desirable always to plan so it can be directly above the kitchen and the kitchen above the laundry room or adjacent to it. If the bath and kitchen are to be on the same floor, it simplifies the plumbing to have the bath adjoining the kitchen.

In remodeling an old house, or planning a new house, special attention should be given to the plumbing system. All pipe that are supposed to go into the walls should be put in as the house is framed. There are many examples where houses have been remodeled by country carpenters and no thought was given to the job of plumbing until the walls were plastered and the floors laid. This is where the owner has given no thought to the matter of plumbing. The farmer must not overlook the fact that the work of the plumber and electrician must be carried on along with the carpenter and brick mason.

For simple installations about the barn, or house, the owner should very carefully take measurements and prepare a sketch of how the pipe are to be arranged, showing the location of hydrants and fixtures. Such a sketch is valuable whether he makes the installation or whether it is installed by a plumber. If the owner does not have tools for cutting and threading pipe, he can take the sketch to his local plumber and not only get an accurate statement of the cost of pipe and fittings to meet his needs, but also get the pipe cut and threaded so he can install it. If there are a good many different pieces of pipe, it will save time to mark them and designate the pieces on the sketch. This will make it easy to assemble the system later.

The owner who installs his own plumbing must always keep in mind the fact that it is important to connect the water pipes so they can be drained. If the water pipes do not drain when the water is cut off and the valves are opened in cold weather, the water is liable to freeze and the pipes may burst. This has often happened, resulting in needless expense and discouragement as far as the use of plumbing is concerned.

Any farmer who can use a wrench can connect up a sink and drain and a pump to provide water in the kitchen. Besides the sink, pump and pipe all that is needed are a few fittings and a trap. A trap can be bought that can be fitted up with union connections, making it easy to install.

Many plumbing systems are out of order due to the need of some simple repair. Maybe a new rubber is needed for a hydrant or a valve, that does not cost more than 10 cents and will not take more than 10 minutes to repair. Leaky faucets and toilets will waste a lot of water in a short time and will cause much inconvenience if the water must be cut off.

The farmer should study his plumbing if he has a complete system so that he can take care of the simple repairs without having to have a high priced expert come into the country. A simple inexpensive tool that should be found in every home where there is pl mbing is the "plumber's pump" or "plumber's friend" that is used to force the waste through when a pipe is clogged or partly clogged. Many plumbers are called to unstop a pipe when anyone can easily do it with such a tool, the price of which is less than one-half hour of the plumber's time.

Where the man of the house knows nothing about doing simple plumbing jobs, he will find that there is considerable expense in keeping a plumbing system operating properly. There is little question but that to have running water in the home, making possible the bath, the toilet and other conveniences for more efficient living, is worth all it costs.

PEACH growers from Hammonton, New Ulm and Acosta, N. J., and representing more than 1000 straight car shipments of peaches, met at Hammonton recently to take the initial steps toward forming a co-operative growers' association. Layton Parkhurst of Hammonton was appointed chairman of the meeting and after a general discussion and a talk on marketing fruits by Fred Morinelli, Philadelphia receiver, a committee was appointed to investigate the methods and organizations of other co-operative associations. There will be another meeting within the next few weeks to perfect the organization.

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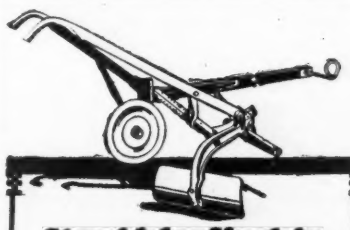

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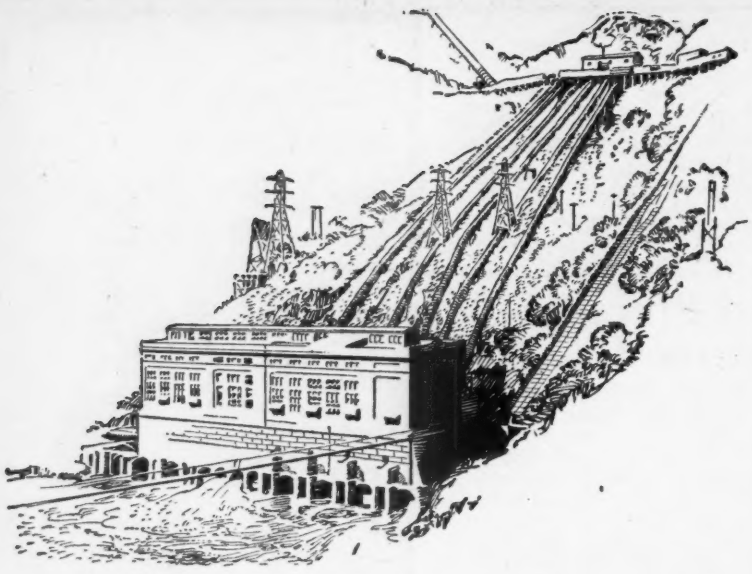

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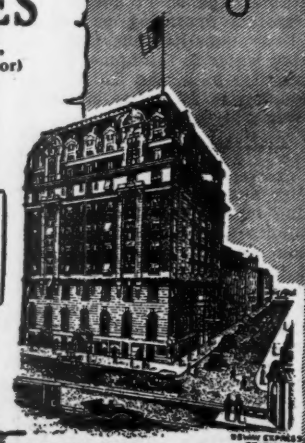

ABSOLUTELY FIREPROOF

Pruning the Apricot

(*Continued from page 7.*)

nearly as well as those receiving only a thinning in 1920, even somewhat better perhaps due to succession of dry years. (Adequate irrigation has not been available.) The trees are intermediate in size between those heavily headed and those only thinned out. This method of pruning is very much more expensive than the other systems.

Those trees which have been pruned by only thinning have borne most satisfactory crops and at the same time are fine specimens of a fruit producing machine, being well clothed with fruit-spurs throughout the tree.

Summer pruning, especially late summer, weakens the tree, removing as it does a considerable portion of the foliage just at the time it should be storing the tree for the following season's wood and fruit crop.

Considered from all angles there is no doubt that the lightest pruning which is consistent with the securing of a desirable framework is that which should be employed in bringing the tree to bearing.

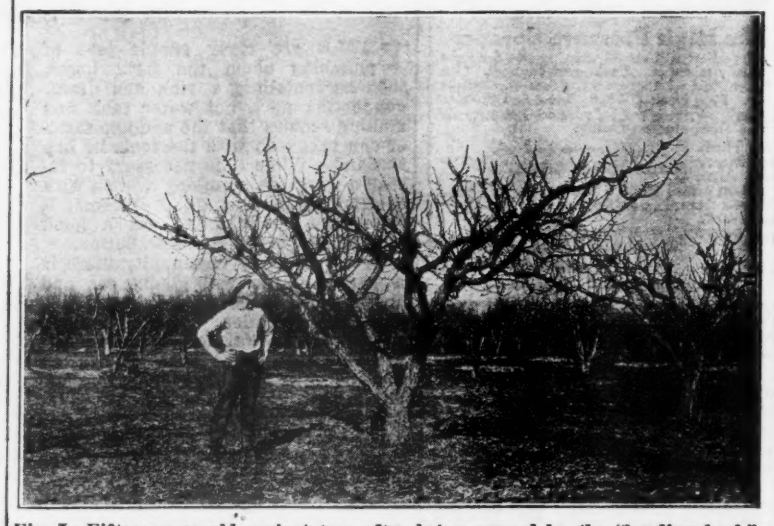

Fig. 5—Fifteen-year-old apricot tree after being pruned by the "heading back" method. This results in reduced fruiting area and improper shading of the fruit.

Pruning the Bearing Tree.

Attention should be drawn at this point to the fact that the same principles or factors governing the growth of non-bearing trees do not necessarily hold when bearing trees are considered. One of the most important periods in the life history of a fruit-tree is the transition from the formative stage to that of full maturity.

In order to better comprehend certain plant responses, facts should be recalled concerning the annual cycle of growth and development of the fruit tree. The season's first burst of growth (blossoms, leaves and new shoots) is made largely at the expense of plant food reserves normally stored in the tree during the preceding summer and fall. These stored plant reserves are thus very materially used up during the early part of summer, and as a consequence, the concentration of cell sap is lowest at this time. The crude sap taken up by the roots is transported to the leaves, where with carbon-dioxide from the air, the complex plant foods are elaborated. After the active vegetative period of early summer is past, the plant begins to store such elaborated foods as are not needed for the promotion of diameter growth, nourishment of the current fruit crop and development of fruit-buds for the succeeding year's crop. As the season advances, the cell sap, under favorable conditions, becomes more and more concentrated, indicating the storage of reserves for the winter months and the following year's growth. Any practice which will aid this normal development of the tree should materially benefit succeeding wood and fruit production.

Fig. 6—Note the attempt to build a "second story" on a "short pruned" apricot tree in order to increase the fruiting area. Note also the dense shade brought about by the severe cutting.

Severe Dormant Pruning Results in Rank, Succulent Growth.

It has been demonstrated many times that heavy cutting during the dormant period, whether done on young or old trees, will result in rank succulent vegetative growth the following season. Unfortunately many growers have mistaken these rapidly growing shoots as a sure indication of a healthy and vigorous condition of the trees. Pruning, however, may be so severe that the proper balance between the vegetative and reproductive

functions are disturbed to such an extent that the new growth will take practically all the plant's energies to maintain and extend it far beyond the proper time for the termination of such development and the beginning of storage of synthesized plant foods.

Thus if the bearing apricot tree is pruned so severely that it makes anywhere from three to twelve feet of new growth over the entire top, as the writer has seen time and time again in different sections of California, then it is quite safe to assume that such trees are being pruned too hard and wood growth is being produced at the expense of future fruit production. Severe dormant cutting accomplished this in several ways.

First—The balance which always tends to exist between root and top during the dormant season is destroyed and during the following summer the tree attempts to restore this balance by making new shoot growth rather than fruit-spurs and fruit buds.

Second—Heavy cutting materially reduces the stored food reserves during the first part of the season, thus cutting down the tree's ability to make healthy shoot growth, to mature its crop and to set fruit buds for the next season thereby tending to induce biennial cropping.

Third—Excessive shoot growth, induced by heavy cutting, by its own growth shades out the desirable fruit wood in the lower parts of the tree.

Fourth—Excessive and prolonged shoot growth induced by heavy cutting results in less storage of reserve materials, a lower sap concentration and therefore a lessened ability to withstand frost.

It is a well known physical fact that the higher the concentration of a solution the lower is its freezing point. Whitten reported that "in Missouri, one plot of peach trees which had continued rank length growth until frost in autumn, had all their flowers killed at a temperature of 27 degrees. The following night the temperature dropped to 22 degrees. An adjoining plot of trees, which ceased length growth early, but which maintained healthy mature leaves to store plant food until autumn, endured the lower temperature safely without injury to their blossoms." Similar results have been obtained on various kinds of deciduous fruits in California, especially with the apricot, which, on account of its early blooming habit, is more subject to frost injury than some of the other fruits.

Fifth—A headed back apricot tree tends to produce its fruit in clusters which compete with each other, rendering sizing more difficult, especially when a heavy tonnage is produced. There is less leaf area per fruit with the headed tree than with the thinned tree where the fruit is better distributed. Where the fruit is borne in clusters ideal conditions are presented for the development of the dreaded brown rot disease.

Sixth—In the case of headed trees the fruiting area moves higher and higher each year.

Ten to Twenty Inches of New Growth Necessary in Apricots.

On the other hand, it must be clearly understood that the results accompanying too little vegetative growth are as disastrous as those attending rank succulent development. In the case of the apricot 10 to 20 inches of new wood must be produced each year, because:

First—The apricot fruit-spurs remain economically productive only over a maximum period of three years and new spurs must be produced annually to take the place of those lost.

Second—There appears to be a close correlation between the vegetative vigor and ability of the tree to size its fruit. New shoots of the apricot normally terminate by the time the fruit is ripe and growers generally recognize that if a healthy development of new growth takes place that the fruit will size properly.

Third—If too little or no pruning is done, the tree will attempt to ripen too large a crop resulting in small fruit, poor quality and no wood growth for the insurance of future crops. It should not be forgotten that it is commonly assumed that more tree energy is necessary to produce two small fruits, with two seeds, than one large fruit, with one seed, weighing as much as the two small fruits. Theoretically the production of seeds taxes the energy of the tree far more than the production of an equal weight of flesh.

Fourth—Under certain climatic conditions, terminal fruits of the apricot left by a thinning method are of poor quality, being especially subject to sun-scald. These fruits should never be left on the tree but removed early in the season by means of a light pole terminated by a piece of rubber hose. In addition to being of poor quality, these fruits may cause some breakage, especially when trees are first being pruned by the thinning method.

In order to test the truth of the statements presented above, the writer in 1916 started an experiment with a block of 15 Tilton apricot trees which at that time were eight years of age, having been planted in 1908. Five trees were pruned by each of the three following methods: heavy heading, light heading, and thinning out. In all cases the trees before heading were properly thinned out. Up to the beginning of the experiment the trees had received a uniformly heavy thinning out and heading back. As a result of this treatment, the annual wood growth averaged from four to six feet and the crop produced ranged from 25 to 50 pounds per tree. The following table presents the yields for the past six years. A heavy freeze during the spring of 1921 destroyed the entire crop for that year. These trees are adjacent to each other and have received identical cultural treatment except for the pruning. Adequate irrigation has not been available and the yields and sizes might have been better in all cases had water been available. There is a question in the writer's mind as to whether the trees received at all times sufficient hand thinning of the fruit.

TABLE IV. — HEAVY VERSUS LIGHT PRUNING FOR BEARING APRICOTS.

Pruning Treatment.	1916	1917	1918	1919	1920	1922	Total
Heavy Heading—							
Yield ..	19	59	29	73	24	53	257
Size ...	8	9	9	9	10	8	
Light Heading—							
Yield ..	20	119	97	169	252	241	898
Size ...	10	9	10	8	14	13	
Thinned Only—							
Yield ..	60	171	178	137	172	215	933
Size ...	13	10	11	10	10	10	

Yield—Average per tree in pounds.
Size—Number of fruits per pound.

A study of the foregoing figures will show that:

First—Heavy heading has consistently given a very low yield and generally the largest fruit. Even with the low yields there appears a very decided tendency towards biennial cropping.

Second—The trees receiving a light heading in addition to the thinning have yielded almost as much as those thinned only. This system of pruning is much more expensive and from the results obtained does not seem justified.

Third—The trees pruned by thinning only have yielded a somewhat greater total of fruit of good size.

The trees receiving the lighter pruning are after the six years' treatment clothed from crotch to top with fruiting spurs. Thinning and picking have not been made unduly expensive as the trees have been kept within reach.

It will not be out of place to introduce at this place the results of a thinning experiment with apricots conducted by V. C. Blanchard of the Agricultural Extension service in Los Angeles County during the 1922 season.

HAND THINNING OF APRICOTS.
Parmentier Orchard, San Fernando Valley, 1922.

Pruning Treatment.	Thinning.	Size.	Yield.
Thinned only.....	½	9-10	300 lbs.
Heavy heading.....			
Clusters—	½	14-15	240 lbs.
None	None	17-18	200 lbs.
Thinned only..	Terminals	12	

It will be noted that light pruning accompanied by hand thinning resulted in most satisfactory yield and

First we must gather the facts

A half million farms are already electrified. Millions are not. Why?

Because a light and power company cannot economically serve a few, scattered farmers, because farm equipment and farming methods are not yet adapted to the utilization of electricity, and because electric service cannot be intelligently rendered before the needs of farmers are known.

The first task, then, is to gather all the facts. In this a special committee is now engaged, which is composed of experts representing the United States Department of Agriculture, Department of the Interior, Department of Commerce, American Farm Bureau Federation, American Society of Agricultural Engineers, Power Farming Association of America and National Electric Light Association.

The first step toward electrifying our farms has clearly been taken. Electrification itself will follow when the Committee indicates what basis is sound both for the farmer and the light and power company.

A booklet has been published outlining the work of the Committee. Write to E. A. White, care American Farm Bureau Federation, 58 E. Washington Street, Chicago, Illinois, or to National Electric Light Association at 29 West 39th Street, New York City, for it. It costs nothing. Read it and pass it on to your neighbor.

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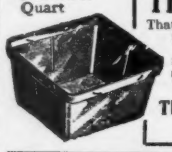

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sizes, giving much better satisfaction in both regards than severe cutting. These results were to be expected if the principles set forth above are true.

Thinning Out Method Favors Maximum Development of Tree and Fruit.

A thinning out method favors to the fullest extent the maximum development of tree and fruit. Young trees thus handled are in comparison with heavily pruned trees, of the same age, larger both in top and root; shorter but more numerous new laterals are formed and the admission of more light to the interior of the tree stimulates the production of a continuous fruit-spur system from the lowest crotch upward; come into bearing from one year to three years earlier; are more prolific, with fruit better distributed over the trees; withstand frost better; and in some instances the pruning is less expensive.

Trees pruned by a heading-back process are smaller, less stocky, are slow in coming into bearing, do not bear maximum crops, and are possibly more subject to winterkill and frost injury.

Unfortunately many growers have come to regard pruning as the panacea for all orchard ills, disregarding the fact that it is only one link in the chain of production. Likewise,

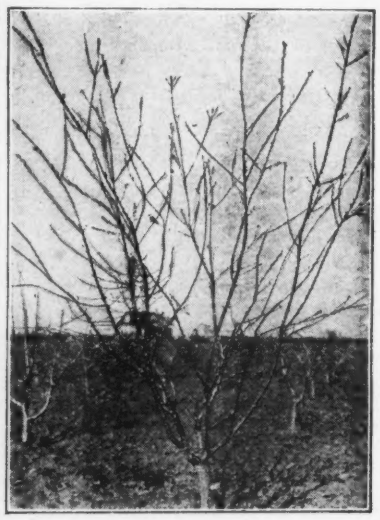


Fig. 7—A two-year-old apricot tree after being pruned by a light "thinning out." No heading was deemed necessary. The main framework branches have already been secured.

when, as during this past season conditions arise which in some cases resulted in small fruit of inferior quality something or someone had to be blamed and the comparatively new pruning recommendations have in many instances been unjustly held accountable.

In putting into practice any orchard operations, difficulties in many instances are apt to arise due to the modification which must be adopted in order to adapt such new methods to local conditions. The so-called "long pruning" system, which is essentially a thinning process, will in practically all cases, produce a heavier "set" of fruit. In order to secure proper size, and quality of this potentially increased crop, many growers must resort to standard orchard operations, which under previous conditions they may never have had to consider. For instance, hand thinning of the fruit, proper bracing of the bearing trees, and provision for more adequate soil moisture are perhaps the most important operations, which, with the greatly increased production, will prove highly profitable to the grower. The fact should perhaps be emphasized that although an orchard may be brought to bearing age with a relatively small amount of soil moisture, nevertheless when the trees come into bearing, a plentiful water supply must be present or disaster will result. The heavier the fruit crop, the greater the amount of water that must be available.

The Best Methods of Fruit Growing Pay on Home Farm

(*Continued from page* 35.)

"No," was his emphatic answer. "There is all kind of land in this part of Iowa as well suited to fruit as my land. It's just a clay loam with clay subsoil and lies so there is good drainage. Drainage is very important."

He has found Moore's Early, Worden and Concord grapes the most profitable. In apples he is partial to Northwestern Greenings, Snows and Malindas. They bear heavily and bring good prices. Wealthy, Duchess, Ben Davis, Winesap and Delicious are others of his good commercial varieties.

He has found top-working of the trees an effective way to protect them from winter killing. The last few years he has been using the Virginia Crab, a very hardy variety, to graft on and believes in these two ways that he is going to make his orchard practically immune to winter killing.

THE COMPLETE destruction of all parts of diseased plants and the use of disease-free planting stock is the only way in which the mosaic disease of red and purple raspberries can be effectively controlled, says the plant disease specialist at the New York State Agricultural Experiment Station at Geneva, where an intensive study of raspberry diseases is under way. By following this practice, growers may secure clean plantings and prevent reinfection.

The Station experiments have also shown that, where the disease is at all prevalent in a raspberry planting, the apparently healthy plants on either side of a diseased plant must also be removed for best results. In a station planting of 29 varieties, it was found necessary to remove 29 per cent of the plants because of mosaic in 1922. The plants adjacent to the diseased plants were not removed and the next year 10 per cent of the remaining plants had the disease. In other plantings where the seemingly healthy plants next to diseased plants had been removed, only about two per cent of the plants showed the disease the next year.

"Four things are essential to the effective control of mosaic," says this authority. "These are (1) the recognition of diseased plants in a planting, which requires more or less experience; (2) the removal of all diseased plants in June, followed by a second inspection and roguing in August; (3) the removal of all parts of diseased plants, including the roots, to a point entirely outside the planting where they may be burned; and (4) the digging and destruction of all bushes standing next to diseased plants."

THE NEWLY elected board of directors of the Sun-Maid Raisin Growers held its first meeting at Fresno, January 25. Ralph P. Merritt, who has been president since Wylie M. Giffin resigned last summer, was re-elected president and managing director. Other officers elected were: Frank H. Wilson, Dinuba, vice-president; Clayton Chandler, Fresno, secretary; Leslie Einstein, Reedley, treasurer; Harry M. Creech, general counsel; Jay L. Reed, assistant secretary and comptroller.

The board of directors was elected last week by the newly created advisory council, and the latter elected direct by the growers. The board of directors, as now constituted, is composed of Merritt, Wilson, Chandler, Einstein, V. D. Whitmore, G. M. Kaprielian, Frank G. Hight, J. M. Leslie and Geo. T. Boyd.

The old board was composed of Merritt, Wilson, A. G. Wishon, W. V. Bucker, H. H. Welch, S. Parker Friselle and Milo L. Rowell. The latter resigned some time ago upon being named receiver for the old organization, which is now being closed out of business.

There's fun in making tobacco that brings such letters

The one below is from a seventeen-year veteran of the pipe

The man who has found the right job, the right wife, and the right smoking tobacco has little reason to envy his fellows.

Of those three factors in human happiness we have put tobacco last, because it is, of course, the least. Nevertheless, some Edgeworth smokers write us as though the most important thing in life were the right tobacco.

We imagine that is because the right tobacco does make even the rightest job and the rightest wife seem a little bit righter.

And so, when a good friend sends us a letter saying that he has smoked Edgeworth for seventeen years, we venture to picture him enjoying seventeen years of solid contentment, with ourselves as contributors.

That's why we enjoy making Edgeworth; and here's the letter from a seventeen-year Edgeworth smoker.

Larus & Bro. Co., Norfolk, Va.
Richmond, Va.

Gentlemen:

Permit me to toss my hat into the Edgeworth ring.

I have always admired the modest tone in which you touch on the merits of your tobacco, instead of advertising it as the best pipe smoke on earth—as, in fact, I believe it to be.

Seventeen years ago my father saw a friend filling his pipe from a tin of Edgeworth Slice and asked for several slices to bring home to me. It is worthy of note that the package was attractive enough in itself to excite my father's interest in the first place; but when I add that, so far as I am aware, he never used tobacco in any form during his entire life, it is still more remarkable.

Up to that time I was a member of the "Tried 'em All Club." Can I put any more steam behind this testimonial than to say that for seventeen years I haven't spent a dollar for any pipe tobacco other than Edgeworth? The Ready-Rubbed school of smokers enjoys my respect, but for me—give me Edgeworth Slice. Brother, it's a *man's* smoke and it *stays with you!*

Long may you make it and long may I smoke it.

One of your boosters,
K. F. Chapman,
1407 Omohundro Ave.

Edgeworth may not be the right tobacco for *you*—but we'll gladly send you complimentary samples from which you can decide for yourself. If you like it, you won't be alone.

So if you haven't tried Edgeworth, send us your name and address and we will immediately forward to you generous helpings of both Edgeworth Plug Slice and Ready-Rubbed.

For the free samples, address Larus & Brother Company, 83 South 21st Street, Richmond, Va. If you will also include the name and address of your tobacco dealer, it will make it easier for you to get Edgeworth regularly if you should like it.

To Retail Tobacco Merchants: If your jobber cannot supply you with Edgeworth, Larus & Brother Company will gladly send you prepaid by parcel post a one- or two-dozen carton of any size of Edgeworth Plug Slice or Ready-Rubbed for the same price you would pay the jobber.

Control of San Jose Scale

(*Continued from page 8.*)

Bordeaux sprays) has been used in the summer sprays after the young scale "crawlers" start hatching, to prevent undue spotting of the fruit and to protect the limbs and twigs from being killed before the time of the dormant sprays. If this insecticide is used during the growing season, precaution should be taken to make the application during the cool part of the day. It is not advisable to use this spray solution when the temperature is above 90 degrees Fahrenheit. Injury to fruit and especially to foliage is likely to result from its use during extremely high temperatures.

Only a partial control of the scale can be effected during the summer season. The high summer temperatures cause the oil in the spray solution to evaporate so quickly that only the tender stages of the insect will be killed. Complete eradication of the scale cannot be expected with summer treatments with any insecticide. With trees in full foliage it is impossible to cover entirely all parts of the trees with the spray. The best result that can be hoped for with a summer application is to hold the scale in check until the dormant spray can be applied. The only time when bad infestations of the scale can be completely controlled is during the dormant season.

Method of Preparation.

The method of preparing the stock emulsion is so simple that any grower with the proper equipment can make his own emulsion. The stock emulsion, made by the boiled process, is prepared as follows:

Red engine oil.....	1 gallon
Water	½ gallon
Potash fish-oil soap.....	1 pound

The oil, water and soap are placed in a tank and heated until the contents come to a boil. Just before boiling, a brown scum appears on the surface of the mixture, and as the boiling continues, the brown scum will disappear. At this stage the heat should be cut off and the entire mixture should be pumped twice, while still very hot, under a pressure of about 60 pounds. Heating the mixture and stirring is not sufficient to produce a proper emulsion.

The oils that have given the best results are the heavy "red engine" oils suitable for use in a stationary gas engine. Potash fish-oil soap should be used for emulsifying the mixture.

The most satisfactory method of preparing the emulsion on a large scale is to employ live steam for the cooking. A power sprayer may be used for the pumping but the most satisfactory equipment for emulsifying the mixture is a steam pump.

Advantages of Oil Emulsion.

The low cost of lubricating-oil emulsion reduces the dormant spray bill one-half as compared with the cost of the usual insecticides used for the control of the San Jose scale. Another advantage of oil emulsion is the fact that hired hands will do a better job of spraying with this solution than they would with more caustic insecticides. They are not so cautious about dodging the spray when it does not burn the face or eyes. Oil emulsion also leaves the spray-rig in much better condition after an application than is the case with many insecticides.

Soft water should be used with the stock emulsion for spraying, whenever possible. Hard water in many instances will set free some of the oil in the emulsion. Lime-sulphur residue in the spray tank or in the spray pump will also produce some free oil. If hard water must be used for spraying, the addition of a weakened Bordeaux, at the rate of ¼-¼-50, will make hard water mix with the stock emulsion. Care should be taken to protect the stock emulsion from freezing, which occurs when it is exposed to temperatures of about 15 degrees Fahrenheit.

Thorough spraying with a two per cent lubricating-oil emulsion in the dormant season will clean up bad infestations of the San Jose scale. It is advisable to make two dormant sprays in orchards that are incrusted with the scale. No signs of injury to trees from the use of lubricating-oil emulsion as a dormant spray have been noted. In northern latitudes this oil spray should be applied as a spring dormant treatment to safeguard against injury, which may occur when severe cold weather follows the application of an oil spray. Protracted cold weather rarely occurs in southern apple sections and this may account for the fact that late fall sprays with lubricating-oil emulsion have been used with safety in southern apple sections. Nevertheless, it is preferable to make the spray application in the spring, on days when the temperature is above 40 degrees Fahrenheit.

Very thorough work should always be done in spraying to control the San Jose scale. To insure a complete coating of the trees with the spray solution, it is best to spray one side of a tree row at a time using spray rods, with one man in the tower and another on the ground. It is well to take advantage of the wind, spraying with the wind behind the mist of spray. It is almost impossible to wet the small tips when spraying against the wind. When the wind changes, the opposite sides of the tree rows should be sprayed. When spraying according to this method, in reality two-thirds of a tree row is sprayed from each side, thereby being assured that no spots are missed.

Sun-Scald of Grapes and Its Relation to Summer Pruning

(*Continued from page 20.*)

posed to the sun were greatly retarded in ripening, being from a few days to almost two weeks later than those on vines where summer pruning had not been practiced. In some cases the market value of grapes had declined appreciably before the fruit finally ripened. There is also the danger that the rest of the growers in the locality may have completed the harvesting and shipping of their crop so that grapes appreciably delayed in ripening may have to be marketed locally solely upon the initiative of the individual grower rather than cooperatively.

In addition to the injurious effect on the fruit exposed, the removal of any considerable amount of foliage weakens the vine to a certain extent and the resultant production of lateral shoots delays the maturing of the wood in the fall, which in turn renders the vine more susceptible to winter injury.

Ordinarily, under most conditions, the grape clusters need about all the shade protection that normal growth will afford.

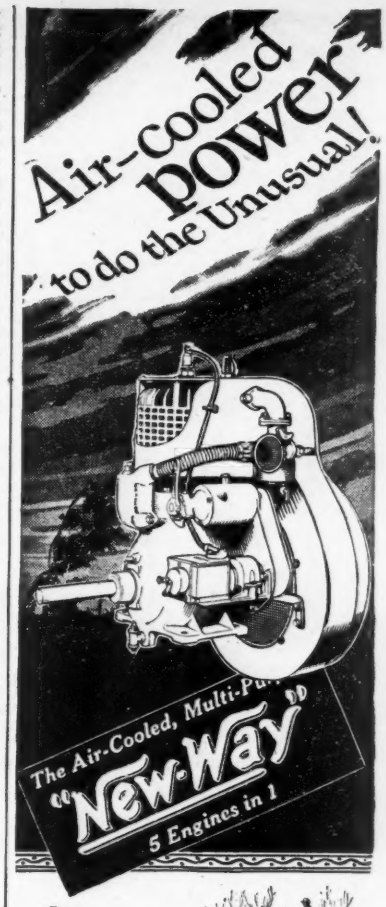
Pollinizer for J. H. Hale

What variety of peaches will make a good pollinizer for J. H. Hale? I have it planted with Elberta and it does not appear to be a highly satisfactory combination.—J. F. R., New York.

IT HAS never been actually determined what peach variety is the best one to plant with J. H. Hale for pollinizing purposes. Any variety producing an abundance of good pollen and blooming at the same time should prove satisfactory.

One Canadian grower reports that the Greensboro peach is an excellent pollinizer for the J. H. Hale and he uses this variety altogether for that purpose. It may be that another variety would be preferable in other sections, but I would suggest that you give the Greensboro a trial anyway, if it ripens at a profitable season for you. If not, I would suggest that you plant some of the following: June Elberta, Rochester, Belle of Georgia, Stark Early Elberta and Krummel October.—Paul Stark.

Subscribe for the American Fruit Grower Magazine—3 years for $1.00.



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Gentlemen—We purchased of you this season three New Way Motors which gives us a total of six of your motors. We have been using these motors for dusting and spraying and they are doing wonderful work. One of the features we like about these motors is that they ***are air cooled,*** which we find a great advantage over the water cooled engines. They develop ***more power and give us the least trouble*** of any engine we have ever used.

Yours truly,
T. G. MacDill, Business Mgr.

In orchard and field cultivation, the "New-Way" engine is supreme. It is *standard* power on the best sprayers and dusters, the best potato diggers, and the best small tractor on the market today. A "New-Way" Air-Cooled engine on *your* outfit will do your work the way you want it done.

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Marshaling the Telephone Forces

In the simple act of lifting the telephone receiver from its hook every subscriber becomes the marshal of an army. At his service, as he needs them, a quarter of a million men and women are organized in the Bell System. One skilled corps of the telephone army moves to place him in talking connection with his neighbor in the next block, in the next state or across the continent. Another highly trained corps is on duty to keep the wires in condition to vibrate with his words. Still others are developing better apparatus and methods, manufacturing and adding new equipment, and installing new telephones to increase the subscriber's realm of command.

The terrain of the telephone army is the whole United States, dotted with 14,000,000 instruments, all within range of the subscriber's telephone voice. Even in the remote places this army provides equipment and supplies. Its methods of operation are constantly being improved, that each user may talk to his friends with increased efficiency. Millions of money are spent in its permanent works. Yet its costs of operation are studiously held to the minimum, that the subscriber may continue to receive the cheapest as well as the best telephone service in the world.

The permanent objective of the Bell System army is to meet the telephone needs of the nation—a hopeless task were not its command unified, its equipment adequately maintained and its personnel trained in the latest developments of telephone art.

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"BELL SYSTEM"
One Policy, One System, Universal Service

Peaches Profitable Beyond Their Days of Grace

by Robert Sparks Walker

AN OLD peach orchard is much like an old horse. Its owner dislikes to destroy it, for after it has almost made him wealthy, it seems that the thing really has a soul.

The average peach orchard that has been well cared for will surprise its owner by continuing to produce profitable crops long after its allotted years have been worn out.

In the year 1910 I visited a commercial peach orchard situated in northwest Georgia. The trees were 10 years old, or had been fruiting that long. The crop was being harvested and I cannot remember of ever having seen a more excellent quality of fruit. It belonged to a business man in Illinois who came down each year and gathered in his dollars. In 1916, the trees had begun to age considerably, and the owner did not wish to pull up the trees, yet he did not think that they would prove profitable in their declining years. I was invited to purchase or find a purchaser for the entire 60 acres of soil at $4500. The orchard was then 16 years old. The state horticulturist of Georgia said that a commercial orchard in north Georgia proved profitable from 11 to 15 years. A peach orchard in Arkansas is reported to prove profitable for about eight years. In Colorado, the profitable age extends from 15 to 25 years, while in the state of New York the profitable age is fixed anywhere from 15 to 20 years.

With these figures before me, I decided that the value of the orchard lay in the real value of the land only. I did not favorably consider making the purchase. But S. T. Polk and his brother, Frank, who farmed and preached peaches nine miles west of the orchard, decided to gamble on the old orchard and they bought it outright. Up to that year, this veteran of the hilltop had the excellent record of only one crop failure. The crop the first year returned the new owners enough to pay off at least half of the original cost. In 1919 the orchard had returned the owners enough to pay the entire cost and it had failed but once in the meantime. In 1920 the crop was sold in the orchard at two dollars per crate, which brought the new owners something like $13,000. In the year 1921, the crop brought the owners a like amount. In 1922 it produced another profitable crop, which, however, was not as profitable as the two previous crops. In the year 1923, it produced half a crop, despite the destructive work of late spring freezes wnich killed so many crops.

Profits are the proof of success in peach growing, and the first question that arises in thinking of this old orchard, is how has it proved profitable beyond its days of grace? First, the orchard has been given careful attention since the trees were set out almost a quarter of a century ago. The soil has been given clean cultivation every year. The dirt has been worked so often that it has left the rows of peach trees standing in veritable hills. The trees have been regularly pruned and many of them have been cut back. The new growths on those which have been renewed have been producing excellent crops. The 60 acres of land are composed of two kinds of soil. The east side of the ridge is red land, and rather fertile; the west side is light and gravelly. The trees growing in the most fertile soil grew much more rank than those in the light soil, hence they are the ones that have had to be severely cut back. The healthiest and most profitable trees at present are those that are growing in the light or poorer soil. Their rank growth has not been such as to make them clumsy in a storm, so they have been able to wrestle with wind and weather and come out the victors. The trees have been kept regularly sprayed each year, and the borers have been wired out of a house and home each year until the last few years, but strange as it may seem, the neglect in this respect has shown no ill effects.

Probably the profits in late years would not have been so satisfactory had the crops not been handled judiciously. When the crop is sold on the trees, the profits are assured, but this has not been the case every year. When at harvesting time the new owners have been thrown in competition with the peach world, Frank Polk remains on the job in the orchard and attends to the harvesting and shipping, while his brother, Ves, skips away to one of the big markets and the cars are shipped direct to him there. By the time the fruit arrives, Polk has his buyers ready to go and inspect the fruit and he sells it to them outright, for cash. In this way, no commission merchant or broker of questionable reputation has a chance of putting a bad deal over, for if the fruit is in a bad condition, Polk is the first man who learns the facts, but such are not often the facts.

Peach prophets find it easy to prove by profits. Profits speak silent truths, and surely many an old peach orchard has been destroyed before it reached the helpless age that its owner erroneously imagined.

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Forged from bars of fine crucible steel carefully tempered in oil, and fitted with hardwood hand grips, which cannot come off, split or pinch the fingers. Weight 3 lbs. Length 24 ins. Price $3.50 postpaid, or sent C. O. D. West of the Mississippi add 25c.

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Duties to commence as soon as possible but not later than April 1, 1924.

Applications (in duplicate) accompanied by recent testimonials, a certificate of health and a recent photograph, should reach the undersigned on, or before, February 6, 1924.

Citricultural experience will be a strong recommendation.

If the successful applicant come from overseas, passage money will be refunded to the amount of £75 if he be a married man and £50 if he be unmarried.

(Sgd.) A. A. ROBERTS, Registrar.

The Almond

(*Continued from page 22.*)

program given the peach, almonds have a very serious pest in the form of the almond mites, commonly spoken of as "red spiders." These very small mites suck the plant juices from the leaves and, if left unchecked, cause them to drop prematurely, often as early as mid-summer. Dormant spraying is recommended against those forms which winter over on the trees in the egg stage while summer spraying with a wetable sulphur or dusting with flowers of sulphur is used against those which are found on the tree only during the growing season.

Harvesting.

Knocking the crop of nuts from the trees with long bamboo poles sounds as though it might be fine recreation. However, with a large crop to harvest, and this while the temperature is still ranging from 90 to 100 degrees, one is soon relieved of any disillusion he may have possessed. The process of knocking consists of giving each branch one or more light, quick blows. When at the proper stage of maturity, these will be sufficient to bring the nuts to the ground in showers. In order to avoid expense in handling, the nuts fall on two large pieces of heavy canvas, known as "almond sheets," previously placed under the tree. As each tree is stripped of its crop, the sheets are gathered up and the nuts dumped into lug boxes placed at frequent intervals in the tree row or onto a low platform drawn through the orchard on sleds or low wheels. Where the crop from any one tree is light, the sheets may be dragged from tree to tree until they are well filled.

As fast as harvesting proceeds, the nuts, hulls and leaves, while still moist, are taken to the huller. Some nuts drop from the hulls as they are knocked from the trees but with most varieties this is true only to a very limited extent. Hand hullers are used by small growers but these merely break the hulls from the nuts and do not separate one from the other. In this case hand sorting is necessary. Combined hullers and separators, operated by a gas engine or electric current are used on most commercial orchards. These are manufactured in different sizes to accommodate the needs of the grower.

Hand Sorting Necessary.

Following hulling, hand sorting is necessary to remove all gummy or inferior nuts or to pick out all pieces of hulls passing through the separator. The nuts are now ready to be spread on trays and placed in the sun to thoroughly dry. With no danger of rain and the hot dry weather usually prevailing at harvest time, drying is quickly accomplished. The nuts are now ready for market except for the fact that a light bleaching is necessary in order to give them the bright, yellow color demanded by the trade. The bleaching process consists first of spraying the nuts with water or subjecting them to steam and then exposing them to sulphur fumes from 10 to 30 minutes. Great care is taken in doing this in order to prevent oversulphuring, which would give the shells a pale, sickly color and might also result in affecting the quality of the kernel itself.

Women felt rather cast down when their brothers, drafted for the world war, said they'd bet the mental tests the soldiers took would easily prove the mental inferiority of women. We feel a little reassured now by learning that the presidents of two very large and successful business enterprises came out at the foot of a recent mental test conducted on the lines of the army tests.

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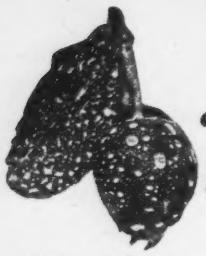

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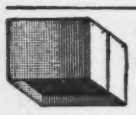

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19	5	4	1	14	7	9	22	5	14	

Can You Solve This Puzzle? The alphabet is numbered—A is 1, B is 2, etc. What two words are represented by the figures? (19 is letter S). SEND NO MONEY—just write the two words and your name and address. Be first—write today.

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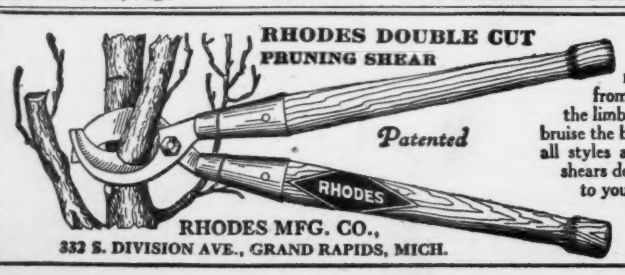

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Present Status of the Olive

(*Continued from page 32.*)

noted for its quick recovery, branches may be cut lower and the trees headed at a suitable height for harvesting the crop.

The trees are usually thinned or set permanently at about 25 ft., but in soils that are conducive to excessive wood growth, they are sometimes set as far as 40 ft. apart to allow light and air to reach the lower portion of the trees. From 18 to 20 ft. is the normal distance for windbreaks, and for formal borders or avenues, they are set at sufficient distance to allow symmetrical development and secure needful artistic balance.

Interplantings May Be Made in New Groves.

Interplantings of peaches, apricots, plums and grapes may safely be made in new groves where there is an abundance of plant food and moisture, or garden crops may be grown between the rows if it is remembered that cultivation and conservation of soil resources are imperative if a normal growth and satisfactory harvest is to be secured. Weeds are allowed to grow after the harvest and, with the coming of the rains, make a good cover crop. This is plowed under in spring before the voracious feeding roots of the weeds deplete the soil about the trees.

Location is ideal when a contour of the land makes irrigation easy. Average soils require irrigation every three weeks and this should be given regularly until the coming of the rains, with perhaps one irrigation to cover any "dryness" that may occur, for the olive feeding roots work busily throughout the year.

Favorable air currents, soil, drainage and marketing facilities are all component parts of successful planting. Rich and heavy soils create undesirable wood formation, cause slow maturity of the fruit and scanty crops and beside the additional expense necessitated for harvesting and pruning the soft sappy growth greatly increases the danger from frost. The olive is one fruit that will not ripen after it has been picked, consequently low lying slopes, flat lands and open tablelands are to be avoided as growth will be checked to such an extent that ofttimes the fruit will be unsuitable for use.

There is a division of opinion among the growers regarding the use of commercial fertilizers. Some contend that the winter cover crop supplies sufficient plant food; others insist that certain prepared fertilizers are indispensable. Both are of the united opinion that it is easy to overdo the matter and that moderation is a necessary watchword.

Prices of Land.

Land suitable for olive production varies in price from $250 to $400 an acre with prevalent prices of from $700 to $1000 an acre for trees already in bearing. The cost of establishing a grove is conservatively estimated at about $100 an acre, with a "sustenance expenditure" of at least $25 an acre to cover such items as water, labor and taxes.

The upkeep of a mature grove will average a little more than $50 an acre. The computed cost of harvesting and marketing olives for pickling and canning is about $40 a ton, while $35 will defray the farm cost per ton for fruit for oil production. Recently the returns have been approximately $175 a ton for ripe olives and about $80 for a like amount processed for oil, and the usual yield is about one and one-half tons to the acre.

Huge retorts in which canned olives are cooked for 40 minutes, at a sustained pressure of 240 degrees, in accord with the Pure Food laws of the state, making the product the safest on the market.

Olive trees produce self-sustaining crops when from five to seven years of age and they reach maturity at 12 years and continue to produce profitable crops for an indefinite period of time, so with her nucleus of 40,000 acres, including new and old groves, and a constructive working organization covering every detail of production "from the tree to the table," California, for the first time in her history, offers not merely an incentive for present planting, but the assurance of a constantly extending market, for the olives and oil from her gray-green groves are destined for world-wide supremacy.

Method of Protecting Fruit Bushes Suggested

AFTER freezing weather has prevailed for some time, the person who grows bush fruits of any kind should "lay down" the bushes, say growers who have been most successful in their culture. By "laying down" is meant bending the plants over until the canes touch the ground, where they are fastened by stakes, rails, or even by weighting with a few shovelfuls of earth.

Some growers find it is advisable to loosen the earth around one side of the bushes so that they may be bent over more easily. Added protection may be given by covering the bushes with straw, held in place by earth.

Currants and gooseberries, being among the hardiest of all fruits grown in New York state, need no winter protection. Of the brambles, red raspberries are the hardiest; the columbian purple cane withstands the cold fairly well, while black raspberries should be ranked in hardiness between the red varieties and the blackberry, which is the most tender of all the bush fruits.

Many varieties of grapes and bush fruits will need winter protection in the coldest sections of the state where the thermometer falls to 30 degrees below zero, but in the regions where these fruits are grown commercially, such protection is not necessary.—*New York State College of Agriculture.*